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COMMISSION STAFF WORKING DOCUMENT

*Accompanying the*

**legislative package on the internal market for electricity and gas**

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**Impact Assessment**

**Lead DG:** DG TREN

**Other involved services:** SG, SJ, DG COMP, DG ECFIN, DG EMPL, DG ENTR, DG ENV, DG INFSO, DG MARKT, DG SANCO, JRC.

**Agenda planning or WP reference:** 2007/TREN/007

Political context

A first liberalisation package was adopted in the late 1990s. Directive 96/92/EC concerning common rules of the internal market in electricity entered into force on 19 February 1997, whereas Directive 98/30/EC on common rules for the internal market in natural gas entered into force on 10 August 1998. These Directives were repealed following the adoption of a second regulatory package in 2003 (in particular Directive 2003/54/EC for electricity<sup>1</sup> and Directive 2003/55/EC for gas<sup>2</sup>)

During this time, the basic concepts of the internal energy market have become embedded in terms of the legal framework, institutional arrangements and the physical infrastructure such as IT equipment. However, at the same time, meaningful competition does not exist in many Member States. Often customers do not have any real possibility of opting for an alternative supplier. Even customers who have successfully changed supplier are often not satisfied with the range of offers they receive. In summary, stakeholders do not yet have a high degree of confidence in the internal market.

Since the informal Hampton Court meeting of Heads of State and government in 2005, followed by the Green paper on an European Strategy for sustainable, competitive and secure Energy adopted by the Commission in March 2006 (COM (2006)105 final), energy and especially the energy internal market, have increasingly become political priorities on the European Commission's, Council's and Parliament's agenda.

As a consequence of shortcomings identified, the Commission conducted throughout 2005 and 2006 an inquiry for the gas and electricity sectors under competition law. The problems are not just the result of incomplete implementation of the existing 2003 Directives, but also the result of built-in structural and regulatory problems not yet addressed. Even in Member States where the current legislation is being fully implemented, problems remain to be solved.

On 10 January 2007, the Commission presented a Communication to the European Parliament and the Council titled "Energy for a changing world". Within this general framework, the Commission adopted two specific papers related to the functioning of the internal market for electricity and gas.

One is a Communication named "Prospects for the internal gas and electricity market", whereas the other is a sector enquiry launched on 13 June 2005, pursuant to Article 17 of Regulation 1/2003 EC. In both documents, the Commission concluded that consumers and

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<sup>1</sup> Directive (EC) 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC (OJ L 176, 15.7.2003, p. 37)

<sup>2</sup> Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC (OJ L 176, 15.7.2003, p. 57)

businesses were losing out because of inefficient and expensive gas and electricity markets. Particular problems include high levels of market concentration; vertical integration of supply, generation and infrastructure leading to a lack of equal access to, and insufficient investment in infrastructure; and possible collusion between incumbent operators to share markets. To tackle these problems, the Commission announced it would pursue follow up action in individual cases under the competition rules (anti-trust, merger control and state aids) and act to improve the regulatory framework for energy liberalisation in place since 2004.

The persistent nature of infringements demonstrates to a certain extent also the insufficiencies and shortcomings of the current EC legal framework arising from the directives. Energy regulators are not granted the necessary powers and independence enabling them to ensure that open markets that function in an efficient and non discriminatory manner are put into place. In addition, the existing legal framework does not allow for a proper and efficient regulation of the cross border issues relating to gas and electricity network access. The fact that access to cross border interconnectors is often granted in a preferential manner shows that current rules are insufficient. Finally, the legal and functional unbundling of network operators that are vertically integrated with production and supply activities, which is provided for under the current directives, does not succeed in ensuring equal access to the networks for all suppliers.

The 2007 Spring European Council invited the Commission to propose further measures, in particular as regards effective separation of supply and production activities from network operation, the further harmonisation of the powers and strengthening of the independence of the national energy regulators, the establishment of an independent mechanism for national regulators to cooperate, the creation of a mechanism for transmission system operators to improve coordination of networks operation and grid security, cross-border trade and grid operation, and increased transparency in energy market operations. The European Council also underlined the need to strengthen security of supply in a spirit of solidarity between Member States.

The European Parliament, in its Resolution on Prospects for the internal gas and electricity market adopted on 10 July 2007, expressed a strong political support in favour of a common energy policy. As regards the internal market, the European Parliament considered in particular that *"transmission ownership unbundling is the most effective tool to promote investments in infrastructures in a non-discriminatory way, fair access to the grid for new entrants and transparency in the market"*. It underlined however that other measures are also necessary and that the differences between the electricity and gas markets may call for a partially different implementation. The European Parliament also called for enhancing *"cooperation between national regulators at EU level, through a EU entity, as a way to promote a more European approach to regulation on cross-border issues"*. Finally, the European Parliament report entails a series of indications on the functioning of the internal market of electricity and gas.

#### Summary of the Commission services' analysis

In the following impact assessment, a number of options were examined and compared. The Commission services' analysis can be summarised for each of the main policy measures.

- Further TSO unbundling: complete separation of ownership between the transmission networks and generation/supply interests (full ownership unbundling) is the solution that

offers the best guarantees from a competition point of view. The level of regulation required to implement full unbundling is also lower than for an ISO and even more so than in the case of regulated unbundling.

- Enhancing the role and coordination of regulators: the status quo is not a viable option, as it emerged from both the findings of the Commission and the stakeholder consultation. Increasing regulators' powers and independence should be extremely beneficial for competition, ensuring a level-playing field for companies in Europe. The costs are very limited compared to expected benefits in terms of market functioning. The lack of coordination between regulators, which was unanimously criticised, would be better addressed through the structure of a Community agency with strong involvement of all EU regulators. The option of setting up a single European regulator is premature at this stage and is likely to encounter strong resistance from a number of Member States and stakeholders.

- Co-ordination between TSOs: Increasing TSO co-ordination is absolutely essential. A balance can be struck between regulatory oversight and "do nothing" by introducing formal coordination between TSOs, the so-called "ETSO<sup>+</sup>/GIE<sup>+</sup>" option, which appears to be suitable for attaining the objective pursued.

- Increased transparency for wholesale markets: Stakeholders supported a full range of data disclosure covering capacity, storage and energy flow data. This is not contradictory with the necessity to protect confidentiality and prevent collusion. A unified approach to improving transparency based on a set of pan-European high level standards of data disclosure for gas and electricity, as proposed by the Commission services, would be very much welcomed by market players.

- Actions to regulate long-term contracts in gas. At this stage, the conclusion of the cost-benefit analysis of further legislative measures concerning long-term contracts in gas was not conclusive.

- Access to gas storage facilities: competition on the gas storage market would benefit from legal unbundling and the implementation of current ERGEG guidelines on gas storage operations.

- The Commission services will look further into the potential benefits that could be expected from creating strategic stocks for gas at EU level. The level of support from stakeholders for such measures is limited for the time being.

- Changes to the framework for investment in gas import infrastructures: Article 22 of Directive 2003/55/EC (gas Directive) for investment in gas infrastructure and criteria for TPA exemptions need to be amended. There is a clear added value from EU action at this level, in order to create favourable conditions for investment.

- DSO unbundling: the benefits from further unbundling at the distribution level are not overwhelmingly higher than costs. Due to the recent entry into force of the last liberalisation date in a number of Member States, it would seem to be disproportionate to go a step further in forcing unbundling in this activity.

- Further actions relates to consumer protection: the Commission services propose to adopt an Energy Charter which should provide a suitable level of protection at EU level, in particular against energy poverty.

- A combination of regulatory measures could ensure that the strategic importance of the EU gas and electricity networks is properly taken into account and that the EU unbundling requirements are correctly respected also by third country companies.

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## **SECTION 1: PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES**

**This impact assessment was prepared in view of a package of legislative measures designed to address the issues identified by the Commission in its Communication of 10 January 2007 (reference: COM(2006)841)**

### **1.1. Organisation and timing**

This impact assessment accompanies the legislative proposal which is part of the Commission's 2007 Work Programme under reference 2007/TREN/007.

#### *1.1.1. Chronology of the IA*

The Energy and Transport Directorate General of the European Commission (DG TREN), launched in September 2006 the preparatory work for this impact assessment to assess policy options related to the completion of the internal energy market for gas and electricity.

Whilst preparing the internal energy market report (COM 2006(841), published on 10 January 2007, DG TREN decided also to study a number of possible changes to the legislation currently in force. The policy options contained in this impact assessment were developed in the following way.

#### *1.1.2. Follow –up on previous Directives and Regulations*

Nearly all Member States failed in implementing properly and on time the second liberalisation package. Infringements proceedings were started against 20 Member States in 2004; some are still open and may eventually be brought to the Court of Justice.

Most of the Member States were not able to comply with the two Directives within the one-year timeframe set by the directives . The "2003 second package" was quite ambitious and required important changes in the sector. The most important changes concerned the structure of the vertically integrated companies (legal unbundling), the preparation of the full opening of the market by 1 July 2007 and the reinforcement of the powers of the national regulators.

### *1.1.3. Benchmarking report and country reviews*

In addition to the annual benchmarking exercise of the Member States, DG TREN decided in 2006 to adopt a new approach, based on on-site visits to most of the Member States in order to assess the functioning of the internal market at national level. These reports were made public as an annex to the main 2006 report.

### *1.1.4. Sector inquiry*

Decided in June 2005 by the Commission and completed in January 2007<sup>3</sup>, the sector inquiry led by DG COMP (in close cooperation with DG TREN) provided a significant input for the assessment of the functioning of the Energy internal market.

The Commission's 2006 assessment of progress incorporating both the sector inquiry and in-depth country reviews of the functioning of the electricity and gas markets in Member States confirmed the slow progress in building a truly competitive integrated European market. This was not just the result of incomplete implementation of the existing 2003 Directives, but also the result of in-built structural and regulatory problems not yet addressed. Even in Member States where the current legislation is being fully implemented, problems remain to be solved.

In March 2007, the European Council formally asked the Commission to prepare new legislative measures.

## **1.2. Involvement of other Directorate Generals**

Given the cross-cutting nature of the planned impact assessment work, DG TREN set up an inter-service steering group. The steering group included the Secretariat General, the Legal Service, and the following Commission Directorate Generals: Competition, Economic and Financial Affairs, Employment, Enterprise, Environment, Information Society and Media, Internal Market, Health and Consumer Protection and the Joint Research Centre. The first meeting of the steering group took place on 9 November 2006, in order to discuss, amend and finally approve the Terms of Reference of an external study (contractor: ECORYS). The contract was signed in December 2006. Due to the sensitivity for stakeholders (in particular market players) of some policy options, an additional consulting firm (Moffatt Associates) was chosen in order to support the work of ECORYS, specifically to assess the questions of ownership unbundling of transmission system operator and transparency of data.

In addition to this external consultation, the Commission services used their own econometric model in order to quantify the impacts of certain measures.

## **1.3. Consultation and expertise**

### *1.3.1. Information sources*

The Commission services used several information sources in order to prepare this impact assessment.

- First, it drew upon the results of the abovementioned report on the internal market and the competition sector enquiry.

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<sup>3</sup> COM(2006)851 final

- Second, it has maintained very regular contacts, usually under the form of meetings or conferences, with a wide range of stakeholders, including Member States, regulators, companies operating in the electricity and gas sector, consumer organisations, trade unions, financial institutions...
- Third, DG TREN decided to rely on a consultant in helping it prepare the impact assessment, in particular concerning stakeholder consultation on a number of policy options contained in the 10 January communication.
- Fourth, the Commission requested the advice of the European Regulators Group for Electricity and Gas (ERGEG) on possible new legislative measures. These ERGEG papers are public<sup>4</sup>.

On 12 January 2007, a kick-off meeting between the consultant and the steering group took place. The objective was to verify the full understanding of the scope of the project with consultants, as well as to indicate some specific organizational and practical arrangements of the team. The log-frame methodology was chosen. ECORYS also proposed to adopt a web questionnaire to meet scale and time constraints, disseminating via a web site and enabling on-line answers.

It was agreed that the consultant would draft a preliminary report, based on a questionnaire which was to be prepared on the basis of input provided by the Commission. The members of the steering group established the list of stakeholders who should be targeted for consultation. The scope of the list offered an opportunity to a wide spectrum of stakeholders to provide their views.

### *1.3.2. Stakeholder consultation*

Stakeholder consultation on the measures to complete the internal market for gas and electricity started very early. The Commission invited stakeholders to give their views to the green paper adopted in March 2006. This document already included the idea that the internal market legislation for electricity and gas should be amended. 1500 contributions were sent to the Commission.

With regard to consultation of Member States, following the adoption of the January 2007 Communication "An energy policy for Europe", the Commission presented its Communication to the Council, and explained the main findings in several Council Energy working group meetings. Member States commented on it and, via the Council of Ministers, each Member State finalised a position paper. Some Member State have expressed detailed views on the content of the internal market report.

In addition, a targeted consultation took place early 2007, which was conducted by ECORYS and Moffatt Associates. The following stakeholders were consulted:

**Regulators:** ERGEG (European Regulators' Group for Electricity and Gas)

**Transmission system operators:** ETSO (for electricity), GTE (for gas)

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<sup>4</sup> See ERGEG website at [www.ergeg.org](http://www.ergeg.org)

**Associations of electricity and gas companies:** Eurelectric, Eurogas, GEODE (small distribution system operators), GIE (Gas Infrastructure Europe)

**Independent producers associations:** EWEA (European Wind Energy Association), EREC (European Renewable Energy Council)

**Consumer associations:** BEUC (European consumers' organisation)

**Industrial energy users' Associations:** IFIEC EUROPE (International Federation of Industrial Energy Consumers), EuroMetaux, EFMA (European Fertilizer Manufacturers Association), Cefic - European Chemical Industry Council, Cimeurope, VEMW Association for Energy, Environment and Water, VIK Verband der Industriellen Energie- und Kraftwirtschaft e.V., MEUC Limited (Major Energy Users Council), UEAPME (the European Association of craft, small, and medium size enterprises)

**Traders and new entrants:** EFET – European Federation of Energy Traders, BNE Bundesverband Neuer Energieanbieter

**Trade Unions** EPSU - European Federation of Public Service Unions, European Mine, Chemical and Energy Workers Association – EMCEF

**NGOs:** World Wildlife Fund (WWF)

Moffatt Associates consulted additional stakeholders, mainly companies which could be affected by the unbundling of their assets but also possible buyers of such types of assets. Financial institutions and investment funds were consulted as well to test the financial feasibility of the policy options of the Commission. In this context, 56 stakeholders were consulted.

The stakeholder consultation by ECORYS focussed on 23 relevant European representative platforms and their members. A total of 339 questionnaires have been filled out by organisations having their roots in 19 countries linked to 15 stakeholder platforms. In addition 73 questionnaires have been filled out by organisation not connected to a particular country or one of the actively approached stakeholder platforms. It should be noted that responses sent to this consultation came, to a significant extent, from vertically integrated companies, which created a bias in the assessment of some of the proposed options. There was no possibility to redress this imbalance in an objective manner. The consultant's report weighted a company response in the same manner as the response by an association no matter how many members it had. The Commission services did not modify the weighting, took account of that fact while drawing conclusions from the consultation.

The stakeholder consultation showed overall support for proposed Commission measures. For instance, concerning ownership unbundling, a majority of respondents to the questionnaire of Moffatt Associates saw the proposed measures as necessary or essential. Regarding the intended effect of the legislative proposals, this support is higher with regard to full ownership unbundling (62%) than with regard to the creation of independent system operators (52%). There were mixed opinions on the cost effects of an extension of the regulator powers, but a clear majority supporting the measure. Respondents also welcomed increased coordination of regulators and TSOs at EU level, as well as increased transparency. Measures for strategic gas stocks did not receive strong support. Regarding consumer protection, replies were understandably mixed, given the differences of views between companies and consumers' associations. (The detailed results are given in the consultant's report.) In parallel, there have

been consultations and regular contacts between the Commission services and established stakeholder groups. Example of such contacts are the Florence (for electricity) and Madrid (for gas) forums. Such forums were set up to discuss issues regarding the creation of a true internal electricity and gas markets. The participants are national regulatory authorities, Member States, the European Commission, transmission system operators, traders, consumers, network users and exchanges. The Forums usually convene once or twice a year. The first meeting was held in 1998 for Florence and 1999 for Madrid. These forums ensure that most stakeholders are fully informed throughout the preparatory process.

## **SECTION 2: PROBLEM DEFINITION**

### **2.1. Main issues**

In its Communication of 10 January, both in the Internal Market report and the Energy Sector Enquiry, the Commission had identified a number of issues to be solved, possibly by introducing new legislation. They are the following:

market concentration and market power;

vertical foreclosure (in particular the inadequate unbundling of network and supply);

lack of market integration (including lack of regulatory oversight for cross border issues);

lack of transparency; price formation mechanisms; downstream markets for gas;

balancing markets

liquefied natural gas (LNG) markets.

Section 4.4 discusses the relationship between the proposed policy options and the structural problems of the electricity and gas markets. Annex IV presents a corresponding table.

### **2.2. Causes**

Most of the problems are linked to the existence of vertically integrated companies, which not only control essential facilities (such as electricity transmission systems, gas transport networks or main gas storage facilities) but also enjoy significant market power in the wholesale and sometimes retail markets. It is important that new entrants are able to invest in new generation and gas import capacity since incumbents, if not properly unbundled, are likely to gain from a position of artificial shortage. In practice, EU companies are often not able to sell electricity and gas across the EU on equal terms as incumbent suppliers. In particular, non-discriminatory network access and an equally effective level of regulatory supervision in each Member State do not yet exist. The high concentration of production, transmission and distribution structures characterising the European electricity and gas system have led to extremely high entry barriers for newcomers. For the transmission systems and distribution systems, economies of scale have typically led to the establishment of natural monopolies, characterised by high fixed and relatively lower variable costs. The emergence of vertically integrated natural monopolies (up- and/or downstream) exacerbates barriers to market entry, thus being an important obstacle to competition and efficiency gains.

These vertically integrated companies have an incentive to hinder the entry and expansion of rivals in order to maintain their market power and thus achieve higher profits. There are many ways in which control of the transmission/transport system can be used for this purpose, ranging from a lack of transparency on available transmission capacity and load profiles to discriminatory terms and conditions for third party access. If access charges are not properly regulated, they may give rise to a "margin squeeze", whereby the vertically integrated incumbent sets access charges at such a high level relative to its end-user prices that the margin is too small to provide an incentive for a new firm to enter the market.

Technical progress and new policy priorities are paving the way, amongst others, for the development of renewable energies and LNG. This puts an additional burden on production and transmission systems, which should be able to cope with more decentralised production

facilities and effectively connect these new facilities with the overall transmission system. Vertically integrated incumbents, who are usually specialised in centralised structures, have little incentive to do so, as opposed to unbundled TSOs that would have any incentive to get access to as many new suppliers of energy as possible.

A direct link exists between network capacity and competition. Vertically integrated companies have a disincentive to invest in their networks; "congestion revenues" are often higher than expected profits from building new links. This disincentive hinders the entry of companies providing energy from renewable sources and is an obstacle to the integration of European markets through of the development of cross-border interconnections.

There is insufficient co-ordination between national energy networks, in terms of technical standards, balancing rules, gas quality, contact regimes, and congestion management mechanisms, which are necessary to permit cross-border trade to work effectively. If TSOs are also active in the supply markets, there is a danger that such collaboration could lead to collusion (e.g. market-sharing) in those markets.

A related problem is that vertical integration may prevent the formation of companies that genuinely operate across national borders (rather than using control of the network to perpetuate market segmentation and thus maintain their market power).

Transmission system operators possess commercially sensitive information about the companies that use the system. Experience in the energy sector and others shows that, in a vertically integrated company, despite the existence of "Chinese walls", it is difficult to prevent the leakage of such information from one part of the company to another. Such information gives the vertically integrated firm an advantage over its rivals which it can use to keep its market power. Even if no abuse takes place, the existence of links between the TSO and a supplier could damage market confidence and thereby discourage new entry and the development of competition. The market power of the vertically integrated company can be increased by cross-subsidisation from network activities to supply activities. This cross-subsidisation does not necessarily have to involve cash flows: network revenues can boost the credit rating of the whole group, thus lowering capital costs for the competitive parts of the group. The regulation of vertically integrated companies is costly and complex, in particular because of the strong incentives and multiple possibilities for discriminatory behaviour that vertical integration produces.

### **2.3. The current framework does not address all issues**

Although the measures taken so far to mitigate these problems have had a positive impact, they have proved insufficient. There are signs that the continuous persistence of dominant positions in wholesale and retail markets is leading some Member States to impose generalised caps on electricity and gas prices. Depending on the level at which such price caps are set, they can prevent the Internal Energy Market from functioning and suppress price signals that new capacity is needed, thus exacerbating the problem of underinvestment.

Although significant progress has been made, status quo is not an option. Already, the shortcomings identified by the Commission, both in the implementation of current legislation and in competition law, are impeding the positive effects of liberalisation. The EU internal market does not truly exist yet and each ministry, national energy regulator and competition authority continues to act without taking into account the EU common interests. In some cases, this may lead to disproportionate advantage for "national champions" in the name of security of supply's objectives.



## **2.4. Expected benefits**

As well as improving efficiency, the internal market contributes strongly to the objectives of security of supply. The prospect of a large EU market for electricity and gas with common rules is a strong incentive for new investment. Competitive markets also encourage diversification since flexibility to react to market conditions is encouraged. An integrated market also provides a more powerful bargaining position for European energy companies when sourcing energy in global markets since there is a larger range of options available as regards supply routes and better access to customers. Security of supply can no longer be considered to be only a national issue. The development and operation of Europe's energy networks must, in the future, be conducted in much more coordinated way, at least on a regional basis, if future disruptions are to be avoided. This is not the case at present and the objective of a coherent and secure European network is far from a reality.

The proper functioning and optimization of the EU electricity transmission system - in terms of reliability, robustness, efficiency and costs – is clearly in the interest of all European citizens and industries. However, in the current regulatory framework, no market actor has an economic incentive to support the R&D activities necessary to drive the future evolution of electricity networks, particularly of the European interconnected system. The main barrier for this type of Research activities is the dichotomy between the actor(s) which are supposed to finance the research/innovation activities and those who will receive the benefits. The pan-European blackout of 4 November 2006 demonstrated the vulnerability of electricity supply in Europe. In its advice delivered at the request of the Commission on 20 December 2006, ERGEG concluded that lessons from the 2003 Italian blackout have not been followed through, and that the following was needed to keep the lights on in Europe in the future:

- Adoption, on proposal of the European Commission, of legally binding operational security rules;
- Development by the Commission of a framework for the electricity network as part of its energy strategy;
- Improvement of the co-operation between EU electricity grid operators which should be publicly accountable for their actions.

The assessment made by the European Commission in its January Communication is widely shared and there are vivid requests from interested parties, especially from electro intensive consumers, to open the markets effectively and ensure a level playing field.

## **2.5. Does the EU have the right to act?**

The European Council and the European Parliament have called on the Commission to propose new legislative measures in order to improve the functioning of the internal market for electricity and gas. The Commission intends to propose amendments to current legislation in force. The Treaty base would continue to be Articles 47(2), 55 and 95, as in the current electricity and gas Directives.

In the discussion on ownership unbundling, the issue of property rights have been raised. Property rights are usually protected by the Constitution at national level. At European level, it is included in Article 17 of the Charter of Human Rights of 2000, which is compatible with tradition, legislation and practice in all the Member States. According to European caselaw, fundamental rights are not absolute prerogatives, but should be taken into account due to their

function in the society. As a result, Article 17 caters for restrictions to the exercise of property rights if the following four conditions are met:

1. Public interest: public interest is protected to the extent that only ownership unbundling allows for effective separation of assets.
2. Conditions defined in legislation: condition met with the adoption of a Directive or Regulation.
3. Proportionality ("to the extent necessary for the general interest"): ownership unbundling and ISO are only proposed because they are really necessary.
4. Adequate compensation for the loss is to be determined in the Regulation or Directive. The case of the Spanish electricity TSO, Red Electrica de España, is interesting: since being listed in 2002, the company value tripled in 5 years, with subsequent benefits for its shareholders (see Annex I). In the case of the UK gas industry, a share splitting approach was used to preserve the interests of shareholders which have subsequently benefited considerably from the break up British Gas (see Annex I).

Regarding the fundamental rights limits, it is clear that if any divestiture would be imposed to the company owning the assets, financial compensation should be put in place. The Treaty is neutral regarding the nature of the property. The Commission services do not intend to propose TSOs' privatisation.

A justifying element for any restrictive effect of the proposed options to the right of establishment and the freedom of capital movements could be found in imperative reasons of general interest (e.g. security of supply)

## SECTION 3: OBJECTIVES

The European Council and Parliament recalled earlier in 2007 that a European energy policy was necessary. One aspect of this policy is the completion of an internal market for electricity and gas. The measures examined below aim at contributing to this general objective. In addition, an energy single market will have a positive contribution to the completion of the objectives of the Lisbon strategy, in terms of competitiveness of the European economy, (through efficient energy prices) and sustainability (via an additional incentive to develop renewable energy sources). There is also an obvious link with other policies of the European union, such as the review of the Emissions Trading Scheme (ETS) or the reduction of CO<sub>2</sub> emissions thanks to the growth of renewable energy sources. The Commission also has a role to play in ensuring that all EU citizens benefit from the liberalisation process.

A range of secondary objectives will play an important role in the overall strategy.

### **3.1. Improving competition through better regulation, unbundling and reducing asymmetric information**

#### *3.1.1. Right to supply and right to buy*

The European Union is still far from the objective of achieving a true internal energy market where every EU consumer has the actual possibility to choose his or her electricity and gas supplier freely between any EU company.

In addition, the European Union has not yet adequately addressed the challenge of investing in the right level of new infrastructure based on a common stable European regulatory framework in support of the internal market. The necessary degree of co-ordination between national energy networks, in terms of technical standards, balancing rules, gas quality, contract regimes, and congestion management mechanisms, which are necessary to permit cross-border trade to work effectively, is largely absent.

#### *3.1.2. Ensure a level playing field through improved regulation*

Both the sector inquiry and the country reviews conducted by the Commission during 2006 have unearthed a variety of specific examples which demonstrate the shortcomings of the existing regulatory framework.

In addition, the existing regulatory framework has given rise to problems in the field of capital movements

The Commission noted these ongoing problems in the electricity and gas market in its report issued at the end of 2005. At the time, it was considered too early to draw definitive legislative conclusions. However, the Commission did commit itself to a number of actions. These have been delivered as follows:

1. The Commission has undertaken detailed country reviews, interviewing market participants in each Member State, including smaller companies and new entrants.
2. Based on the advice of the European Regulators Group for Electricity and Gas (ERGEG), the guidelines on congestion management for cross border electricity exchanges were adopted on 9 November and entered into force on 1 December 2006.

3. ERGEG has developed the regional initiatives in 2006 and is working, via mini fora, towards removing barriers to market integration in the following areas: transparency, access to capacity, and the development of gas hubs.
4. The Commission has completed the sector inquiry. A number of investigations have been launched against companies in the electricity and gas sectors.

The Commission started infringement proceedings related to freedom of capital movements.

The Commission announced it would take action to address the remaining issues in the following areas:

- Ensuring non-discriminatory access to networks,
- Improving regulation of network access at national and EU level,
- Reducing the scope for unfair competition,
- Providing a clear framework for investment,
- Resolving issues relating to households and smaller commercial customers.

The Commission's main objective is to have a complete internal energy market with open competition and effective regulation in place.

### *3.1.3. Efficiency and productivity of the sector and competitiveness of EU companies*

Liberalisation has clearly led to some efficiency improvements in energy supply and delivered savings to customers, particularly in the initial phase. However, Recent increases in wholesale electricity and gas prices have, to a greater or lesser extent, fed through into the bills of end-users and now offset some of the earlier reductions, particularly for the very largest industrial energy users. It is highly questionable that gas and electricity prices are the result of a truly competitive process rather than being the direct result of decision of companies with market power. This is confirmed by the recent London Economics study on wholesale electricity markets<sup>5</sup>, which states that these prices "are significantly higher than would be expected on perfectly competitive markets" even after taking into account the rise in generation fuels.

Thanks largely to the benefits of the implementation of previous EU legislative packages, retail electricity prices have, on average across all users, remained relatively constant in real terms over the period, despite very obvious price increases in the cost of primary fuels, clearly demonstrates the effect of increasing efficiency in electricity supply. The electricity price in particular for households would in fact have decreased if the effects of taxation were excluded. As far as gas is concerned, the factors affecting prices, such as the need to move to higher cost sources of supply, for example liquefied natural gas (LNG), and the continued linkage of some gas imports to the price of oil, would have occurred whether or not competition had been introduced. It must be recalled that energy prices cannot be expected to always remain low regardless of external factors.

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<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/522&format=HTML&aged=0&language=EN&guiLanguage=en>

### **3.2. Improving security of supply by strengthening the incentives for sufficient investment in transmission and distribution capacities**

#### *3.2.1. Coordination of investments between TSOs*

In order to make sufficient transmission capacity available to meet demand and integrate national markets, network operators would need coordinated long-term planning of system development to plan network investments, and monitor the developments of transmission network capacities.

#### *3.2.2. Security of supply and energy dialogue with our main suppliers in gas*

The internal market contributes strongly to the objectives of security of supply. The prospect of a large EU market for electricity and gas with common rules is a strong incentive for new investment. New investment is clearly responding to the price signals in wholesale and balancing markets where these are allowed to function properly.

Competitive markets also encourage diversification since flexibility to react to market conditions is encouraged. An integrated market also provides a more powerful bargaining position for European energy companies when sourcing energy in global markets. This has all been delivered as a result of the liberalisation process and further improvement to security of supply would result from a more competitive framework.

Security of supply can no longer be considered to be only a national issue. The means of addressing such issues cut across national boundaries and will be beyond the powers of any individual country. Specifically, the development and operation of Europe's energy networks must, in the future, be conducted in much more co-ordinated way, at least on a regional basis, if future disruptions are to be avoided.

#### *3.2.3. Promotion of technological developments*

The future electricity infrastructure will have to face three major challenges: a) the integration of the national systems into a properly managed single European system, b) the massive integration of intermittent and non-dispatchable sources, like wind and combined heat and power (CHP), c) the security of the system and its robustness to large scale cascading system problems (for instance to avoid or limit blackouts). Solving these problems with the technologies and operational models which are used today will be either impossible or extremely uneconomical. In theory, several alternatives routes could be followed to implement better solutions. However, at this stage it is still unclear which one would be the best, both technically and economically. The Commission services are taking such developments into account in this impact assessment.

### **3.3. Improving consumer protection and preventing energy poverty**

The Commission believes that improved competitive conditions and security of supply are in the interest of all consumers. Therefore all policy options directly related to these two objectives are contributing to consumer protection.

Enabling easier price comparisons is also a very important measure for all consumers, from the largest companies to all households.

### **3.4 CONTROL OF THIRD COUNTRY INVESTMENTS IN EU ENERGY (ELECTRICITY AND GAS) INFRASTRUCTURE**

Outside the EU, it will be difficult, even impossible for the Commission to prove that the unbundling rules are properly applied and implemented for supply companies investing in EU transmission system operators. This needs to be addressed, together with the conflicts of interests that external suppliers may face. Conflicts of interest include strategic underinvestment to prevent supply diversification, abusive manipulation of transmission systems to favor supply arms, and using supply monopolies to obtain transmission assets at below market prices; all of these have already been identified within the EU.

## SECTION 4: POLICY OPTIONS

The Commission, in its Communication in January 2007, outlined main policy options for improving the performance of energy markets and achieve the abovementioned objectives.

### **4.1. Improving competition through better regulation, unbundling and reducing asymmetric information**

#### *4.1.1. Strengthened TSO unbundling including the two options of full ownership unbundling and ISO*

One of the possible options is "business as usual" which would mean relying on current legislation including legal and functional unbundling for TSOs. Concerning the necessity to further unbundle transmission from other activities within vertically integrated companies, three options were considered. One is ownership unbundling. The TSO would both own the transmission assets and operate the network. It would be independently owned, i.e. supply/generation companies could no longer hold a significant stake in the TSOs. The other option is the independent system operator (ISO) whereby the transmission network would be operated and developed by a third party, fully independent from the vertically integrated companies. A further option was presented at the March European Council, called "regulated unbundling". It consists in the "status quo" from the point of view of unbundling, but would grant further powers to the regulators to regulate in more detail such issues as third party access.

##### 4.1.1.1. Fully (ownership) unbundled TSOs.

The TSO would both own the transmission assets and operate the network. It would be independently owned, i.e. supply/generation companies could no longer hold a significant stake in the TSOs. In some Member States, vertically integrated companies are still partially or completely state-owned. In that case, transmission assets would stay public but, in order to guarantee the independence of the TSO towards the generation companies, different ministerial departments could be responsible for the newly separated activities.

In the electricity sector, 13 Member States have gone beyond the requirements of legal and functional unbundling of the present Directive by implementing full ownership unbundling of the transmission networks. In the gas sector, 6 out of the relevant 21 Member States have opted for ownership unbundling of the TSOs.<sup>6</sup> While ownership unbundling of TSOs has often taken place as part of the privatisation process of state owned monopoly companies, some countries such as the Netherlands, Italy and Spain have, in recent years, carried out full ownership unbundling of largely privately owned energy companies. In Spain and Italy, ownership unbundling was achieved by gradually restricting the shareholding of the integrated companies in the network operators. In the Netherlands, a law passed in the year 2000 required state ownership of all essential grids which resulted in the full separation and

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<sup>6</sup> EU member states with full ownership unbundling for their electricity TSOs are: Czech Republic, Denmark, Finland, Italy, Lithuania, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK. In the gas sector, the TSOs of Denmark, the Netherlands, Portugal, Romania, Spain and the UK are fully ownership unbundled. It should be noted that 6 Member States have a derogation from the unbundling requirements, i.e. Cyprus, Finland, Greece (until end 2006), Latvia, Lithuania and Malta.

nationalisation of the electricity and gas networks by buying out the private shareholders for €1 billion and €2.77 billion respectively.

#### 4.1.1.2. Independent system operators (ISO).

Separate system operators without ownership unbundling: in this case, integrated companies can keep network assets, but the network is managed by ISOs in which they can have no (significant) stake. ISOs need to be "strong" (ISO+), with decisional power over operation, maintenance and investment.

This solution would require separation of system operation from ownership of the assets. Supply/generation companies could no longer hold a significant stake in the independent system operator (ISO). However, the transmission assets themselves could remain within a vertically integrated group. The system operator would be solely responsible for operation and dispatch, being the primary interface with network users, and would exercise control over network maintenance and development decisions. System operators would require sufficient funds and personnel not employed at the same time by a vertically integrated group. The ISO model would require detailed regulation and permanent regulatory monitoring, bearing the following questions in mind:

- What are the tasks of the ISO?
- Does an ISO have investment capacity of its own?
- How would generation companies be prevented from using ISO as a way to stabilise their market shares?

. System operators would require sufficient funds and personnel not employed at the same time by a vertically integrated group. The ISO model would require detailed regulation and permanent regulatory monitoring.

A sub-option of the ownership unbundling (OU) option was elaborated, due to the possible negative impact of the full OU on integrated companies. In this case, the shares of the vertically integrated undertaking are divided into shares of the undertaking owning the transmission system on the one hand and shares of the generation or supply undertaking on the other hand. These shares are attributed to the shareholders of the previously vertically integrated companies.

This option requires closer supervision from the regulator whereas some more detailed requirements will be requested from the national authorities. This option was not defined at the beginning of the stakeholder consultation and it is not possible to assess to which extent it would be supported by market players. One can expect a strong support because this option allows the vertically integrated company not to sell its transmission asset.

#### 4.1.1.3. Regulated Unbundling

The Commission services examined the "regulated unbundling" option presented at the March energy Council in relation to the objective of further market liberalisation. It is very much a "business as usual" scenario, as it does not force further unbundling, and relies heavily on implementation of rules at national level, with the associated risk of further divergence between national markets. It has already been highlighted that consistency of regulatory conditions was the key to the completion of a truly Internal Market for electricity and gas. As



confirmed by regulators<sup>7</sup>, the potential for undue discrimination will always exist where a vertically integrated company undertakes both competitive and monopolistic businesses. This is because a network business can favour the competitive company in its own group over other competitor businesses. 4.1.2. Strengthening of national energy regulators so that powers are harmonised

The 2003 electricity and gas Directives extended the powers of national energy regulators and required to establish authorities with specific competences. However, in many cases, experience suggests that the effectiveness of regulators is frequently constrained through a lack of independence from government and sufficient powers and discretion. For example, the country reviews have revealed that there are many issues for which regulators do not have the necessary effective ex-ante powers such as establishing rules on functional unbundling or on non-tariff access conditions. In other cases, regulatory duties are split between the specific regulatory authority and a ministry or the competition authority.

Regulators would need strong ex-ante powers over the following areas: i) all aspects of third party access to networks, ii) access to gas storage, iii) balancing mechanisms, iv) market surveillance of e.g. power exchanges, v) compliance with functional and account unbundling for distribution system operators, vi) all cross border issues, vii) consumer protection including any end-user price controls viii) information gathering, ix) sanctions for non-compliance. It therefore intends to propose a strengthening of the Directives on this basis.

It is also essential to ensure that decisions at national level do not have an adverse effect on the aspects most critical for market entry and the evolution towards an EC internal market, respectively for gas and electricity. To this effect, certain individual national regulatory decisions, in particular as regards cross border issues and the effective development of competition, should be notified to the Commission. This structure is already used in relation to exemptions for third party access for new infrastructure (under Article 22 of the Gas Directive 2003/55/EC and Article 7 of the Electricity Regulation (EC) No 1228/2003) and in the electronic communications sector since 2003.

*4.1.3. Improving co-operation between EU energy regulators (either: 1. through existing ERGEG function, 2. a more formal Agency approach or 3. an EU regulator) and increasing TSO coordination*

#### 4.1.3.1. Cooperation between regulators

The creation of an integrated EU transmission network implies modifications to the regulatory framework. Removing inconsistencies in investment decisions and network operation has financial implications, including the allocation of costs and risk associated with increasing capacity. In addition, ongoing problems exist in relation to inconsistencies at national level between, for example, tariff structures, capacity allocation rules, balancing arrangements and trading timetables and security of supply measures. The result of these differences in market design is market segmentation with even some national markets remaining split into different local “tariff” or “balancing” areas, which act against the development of the internal market. This segmentation of the European market increases the effect of the dominance of a small number of suppliers and is damaging to security of supply.

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<sup>7</sup> ERGEG Factsheet on unbundling, June 2007, ref No: FS-07-04

Regulators are already seeking to resolve such issues through ERGEG and, explicitly, the regional initiatives for electricity and gas. ERGEG (European regulators group for electricity and gas) has been created by a decision of the European Commission in November 2003. Despite the fact that ERGEG has now become an important player, it does not have the power to take binding decisions. It relies on each individual national regulator to implement or not the recommendations adopted by ERGEG. There are encouraging signs that significant improvements will be delivered in this way. However, progress is dependent on all the involved regulators agreeing on improvements, and having the necessary powers and duties. A greater impetus is therefore required, including more detailed EU co-ordination requiring increased resources. This will be underlined in the Commission report on experience with Regulation (EC) No 1228/2003 which will include a concrete list of actions. Three main configurations might be considered, embodying the necessary delegations of powers in compliance with the EC Treaty, which would require amendments to the legislative framework, in particular as regards the second and third options.

- Gradually evolving the current approach: reinforcing collaboration between national regulators by notably requiring Member States to give national regulators a Community objective, and introducing a mechanism whereby the Commission could review some decisions of national regulators which affect the internal energy market.
- A European network of independent regulators (“ERGEG+”): Under this mechanism, the role of ERGEG will be formalised, and it would be given the task to structure binding decisions for regulators and relevant market players, such as network operators, power exchanges or generators, on certain precisely defined technical issues and mechanisms relating to cross border issues. It would need the appropriate involvement of the Commission, where necessary, to ensure that due account was taken of the Community interest.
- A new, single body at Community level would be set up. It would in particular be granted the responsibility for adopting individual decisions for the EU electricity and gas market related to regulatory and technical issues relevant to making cross border trade work in practice.

#### 4.1.3.2. TSO coordination

The present framework contains very few or no references for TSO coordination. There would therefore be no change to the current situation of relatively low cross-border trade unless new legislation is introduced in this field.

An enhanced level of TSO co-ordination would require a new legislative framework at EC level. Existing associations of TSOs (ETSO - European Transmission System Operators and GTE - Gas Transmission Europe ) work at present on a voluntary basis. These associations can issue recommendations and play a very important role in the different regulation forums (Florence Forum for electricity and Madrid Forum for gas). They regroup all the national transmissions systems operators in electricity and gas.

It is envisaged that the TSO cooperation structures publish network development plans which include the modelling of the integrated network, scenario development and the assessment of the resilience and deliverability of the integrated system. This development plan should be sufficiently forward looking (e.g. at least 10 years) to allow for the early identification of investment gaps, notably with respect to cross border capacities.

In order to ensure complete interoperability between the national grids, a possible option would be to promote the creation of a European transmission system operator focusing on the two main areas of competences which are crucial for the good functioning of the EU internal market: a common planning of necessary investments at EU level and the drafting of harmonised technical rules.

The Commission proposes to reinforce the cooperation between the TSOs, but as stated in the January communication *"efforts should also be made to have a gradual evolution towards regional system operators. These would be independently owned and would require additional unbundling"*.

The European Council of March 2007 endorsed the idea of creating *"a new Community mechanism for Transmission System Operators to improve coordination of network operation and grid security building on existing cooperation practices."*

In the future, the Commission needs to rely more on TSO associations' competences and time has arrived to grant them an institutional role with formal obligations and objectives being added to their consultative role ("ETSO+\GTE+ solution").

They may, for example, be required by the Commission or the regulators, in particular in view of ensuring security of supply, to report on European grid operation and investment as well as the development of technical standards for network security discussed above. ETSO+\GTE+ could be granted the task of adopting recommendations on precisely defined technical issues such as standards and operational rules. They could also, in particular, be responsible for monitoring the developments of networks so as to improve the transmission capacities between Member States. ETSO+\GTE+ would also be responsible for reviewing progress with infrastructure investments, for example on a rolling two year basis as well as interacting with local populations affected by such investments.

#### *4.1.4. Increasing transparency*

The problem of concentration is made worse where dominant companies are not required to reveal information to other market participants. For example, wholesale price movements are often caused by variations in production or the use of import capacity by the largest electricity and gas companies. If smaller market participants are unable to track the underlying causes of changes in market price, they will be at a disadvantage. A higher degree of transparency would also allow for improved market surveillance.

In the current framework, transparency is only partially addressed. ERGEG has therefore already proposed guidelines on transparency and advised the Commission that these should be made legally binding. The Commission intends therefore to introduce binding guidelines for transparency either through new legislation or by modifying the existing electricity Regulation (EC) No 1228/2003. It also intends to improve the transparency requirements for gas using Regulation (EC) No 1775/2005. While the current regulatory framework has limited scope as far as transparency is concerned, the business as usual is also considered in this report.

#### *4.1.5. Modifying the treatment of pre-liberalisation long-term contracts for gas transmission*

Article 32(1) of Directive 2003/55/EC exempts long-term contracts for gas transmission concluded pursuant to Article 3(1) of Directive 91/296/EEC. A possibility would be to delete or change this provision in order to clarify that the legislation also applies to such contracts.

#### *4.1.6. Enhanced Unbundling of DSOs including increasing regulatory scrutiny and reviewing the 100,000 limit*

Full market opening requires distribution companies to ensure fair access to networks, a workable procedure for switching and confidentiality in data handling. However this is often not yet the case. There are many concerns about the incidence of cross subsidies, discrimination in the way information is handled as well as problems with switching procedures and load profiling, including the interaction with balancing rules. Many of these difficulties can be traced back to insufficient unbundling of network companies from supply businesses. Under the existing Directives, DSOs above the threshold of 100 000 customers have the same unbundling regime as TSOs.

Moreover, some market participants argue that the existing Directives do not provide sufficient enforcement at Member State level. ERGEG has already set out a recommendation on best practice for supplier switching and this needs to be enforced. The Commission therefore intends to strengthen the powers of regulators to enforce functional unbundling. Furthermore, DSOs with fewer than 100 000 customers are currently excluded from the basic unbundling requirements in the current gas and electricity Directives. This makes it rather unlikely, without very strong regulation, that other potential users will get fair access to networks.

#### *4.1.7. Control of third country investment in EU networks*

Measures may be needed to control the investment of third country companies in the EU gas and electricity networks. The concern is that effective TSO unbundling may be undermined by third country companies active in both supply and network operation and, more generally, that ownership unbundling would lead to a sell-off of European networks.

The Commission services have identified three options that will assist in attaining the objectives. These options are understood to be complementary. In any event, the first option is essential for the implementation of ownership unbundling. The options are related to:

- (1) Ownership unbundling / TSO Designation: A new Article could be included in the gas and electricity directives to give the Commission the right to verify the unbundling implementation in a so-called certification procedure.
- (2) Strategic Importance of energy networks: this is designed to shield EU energy networks by protecting them in trade terms. The option could be effected by (1) a declaration of strategic importance, without an implementing piece of legislation, (2) legislation followed by a declaration in the event of a trade dispute, or (3) both at the same time.
- (3) Ownership or Control of transmission systems: transmission systems shall be majority owned by persons established in a Member State of the European Community. Transmission system operators shall be established in a Member State of the European Community.

The proposals for effective unbundling specify that supply companies active anywhere in the EU cannot acquire EU network companies. This would exclude also *external* producers and suppliers active in the EU, including state-owned companies, from operating or acquiring networks in the EU. As it would be difficult to ensure effective unbundling of companies outside the EU, the fear is that two companies outside the EU may discriminate against third parties in Member States where one owns networks and the other supplies.

More generally, the concern is that the EU is vulnerable to a strategy of third countries to dominate the EU markets not only in terms of supply but also by acquiring the networks. As this strategy would give third countries an influence on network operation and development, the EU objective of diversifying gas supply could be put at risk. Since long-term supply agreements and the acquisition of network assets are usually concluded with the individual EU companies and have a national focus, there is a risk that the individual companies and Member States do not stand up to political pressure to agree to these deals even if security of supply considerations may speak against these deals.

Another issue is the lack of reciprocity in market opening. While the EU energy market is open for non-EU investors including producing companies, the markets of major EU supply countries are largely closed. The Commission may therefore be interested to ensure reciprocity to obtain better access to third country markets.

#### **4.2. Improving security of supply by strengthening the incentives for sufficient investment in transmission and distribution capacities**

##### *4.2.1. A new framework for gas storage and the imposition of requirements for strategic gas storage*

Competition in the gas sector is limited by the availability of storage, which is often in the hands of the incumbent companies. Although storage is not a natural monopoly, facilities in certain locations may have a large impact on the functioning of the internal market. Voluntary guidelines for good practice for storage system operators (GPSSO) were agreed in 2004 but ERGEG, in its 2006 report on monitoring the implementation of the guidelines, found that compliance was lagging behind. Similarly the sector inquiry highlighted a number of problems in this respect. The Commission services will examine measures to best balance the need for effective access with maintaining incentives for new storage developments. This may need a specific regulatory framework requiring the following: a) legal unbundling, b) the adoption of binding guidelines following further advice from ERGEG, and c) increased powers of regulatory agencies over gas storage on an individual facility basis.

Recent crises in the supply of gas in 2006 and 2007 showed the dangers of relying on a single supplier. There is a question mark on the appropriateness whether or not to impose strategic stocks in gas to companies or Member States in order to guarantee the EU security of supply, in case of major disruptions like the ones the EU faced from different disputes between Russia and transit countries. The Commission intends to propose a solidarity mechanism between the Member States in order to mitigate the effects of such future possible disruptions. A specific study is going to be launched in 2007 in order to assess in detail the costs and the benefits of such measures. Without questioning the reliability of this supplier, the damages caused to the economy of some Member States led the Commission to consider whether the mechanism already in place in present Directives 2003/55/EC and 2004/67/EC needed to be reinforced.

**Option 1:** impose mandatory strategic stocks on the companies as required by the existing oil directive;

**Option 2:** improve the existing mechanism by imposing more transparency and reporting obligation on the levels of commercial stocks;

**Option 3:** create a solidarity mechanism at regional level between Member States.

#### *4.2.2. Modifying the framework for new investments in gas infrastructure*

Reinforcing security of supply and ensuring a competitive gas market are two objectives which the EU has to reconcile. The current possibility to exempt major new infrastructures from regulated third party access (Article 22 of the gas Directive 2003/55/EC) has sometimes proven difficult to interpret and the implementation varies between Member States. Firstly, the "business as usual" scenario has been considered. The second option is to improve the procedure and to clarify the criteria for granting an exemption.

### **4.3. Improving consumer protection and preventing energy poverty**

Concerning consumer protection, experience to date has demonstrated that wholesale energy prices exhibit considerable volatility. This raises the question of whether and how end-user customers, including vulnerable customers, should be exposed to such fluctuations. The gas and electricity Directives require safeguards to protect consumers as well as includes the concept of universal service for electricity. Finally, the annexes of the Directives require that consumers also have to be given rights to transparent contract structures, a dispute settlement mechanism, the right to switch free of charge and protection from mis-selling. The Commission will also keep under constant review the retail markets to assess the effects of liberalisation on households, in view of increasing consumers' confidence in the energy market and limiting the risk of market manipulation.

Time has come to develop "energy awareness" at household consumers' level. The Commission would propose to include specific provisions in this respect in annex A of the Directive.

Some stakeholders (such as energy intensive users and vulnerable customers) face specific problems. Their concerns can be addressed either through the present directive (article 3 on public service obligations) or by the means of specific national measures which have to be compatible with EU competition law (ex special scheme for energy intensive users with long term contracts between the supplier and the big customers).

The Commission announced it would launch a major information and awareness raising campaign in the run up to full market opening in July 2007.

On 5 July 2007, the Commission adopted a Communication to reinforce consumer protection and to strengthen their right to choose supplier. A fully functioning EU internal energy market is the best guarantee for an open and competitive energy sector with high standards of service, safety and quality. Consumers can influence the opening of the European energy markets by promoting competition between suppliers.

A possibility would be to set up an Energy Consumers' Charter; Such a Charter aims at helping citizens in their role as active players on the energy market. To be able to make best

use of their right to choose their supplier – and switch suppliers if they want to – they must be informed of their consumer rights and reassured that these rights will be safeguarded.

Consumers will have sufficient information on which to base decisions about choosing suppliers. They also need clear terms and conditions in contracts and to feel confident that changing supplier – if they wish to do so – will be free of charge.

The charter is not a binding document but the Commission is expecting more awareness of the EU consumers and the public consultation will provide inputs for a future Charter on the Rights of Energy Consumers .

#### **4.4. Interaction between the shortcomings of the internal energy markets and the proposed measures**

The proposed measures form an overall package to address the current shortcomings of the internal energy market. This package displays a high degree of complexity for a number of reasons. Firstly, the identified shortcomings concern different types of market players at different levels of the value chain. Secondly, individual measures, for example the creation of a regulatory agency at European level, do often not only target one specific market problem but are meant to alleviate several shortcomings, in the example the different problems underlying the lack of cross-border trade in gas and electricity. Finally, to solve a particular market problem, such as for example distorted price formation, several different measures targeted at different market participants may be necessary, involving for example TSOs, generators, power exchanges and regulators. It is therefore not always easy to describe and assess the significance of a particular measure in isolation. Moreover, the interdependence of the overall package entails that a modification of a particular measure may require modifications of other measures to achieve the same objective.

To illustrate how the proposed measures tackle the underlying market problems, the Commission services have drawn up a comprehensive table which can be found in Annex IV. The table relates the main structural problems of the energy markets as identified in particular by the Energy Sector Inquiry to the main legislative proposals. It appears for example that more effective TSO unbundling helps to tackle almost all structural problems of the gas and electricity markets. TSO unbundling is expected

- to tackle the problem of vertical foreclosure at its very root,
- to reduce market concentration by improving third party access and thus market entry,
- to promote market integration by facilitating cooperation and mergers between then-independent TSOs,
- to promote transparency by eliminating preferential information flows within vertically integrated companies,
- to help to remedy distorted price formation for example by eliminating the risk of cross-subsidies within vertically integrated companies and
- to contribute to the security of supply by stimulating investment for example in interconnection.

The table in Annex IV also shows that to tackle a specific market problem several different measures are usually necessary. To overcome the lack of market integration within the EU, for example, it is proposed to create new institutional bodies or strengthen existing ones such as ERGEG, ETSO, GTE and national regulators. Moreover, market integration will be helped by structural or regulatory measures such as more effective TSO unbundling and improved rules on transparency and access to storage and LNG.

While necessarily remaining at a rather abstract level, the table in Annex IV provides an overview of how the many of the specific measures are linked to the more general policy options as well as to the underlying market problems.



## **SECTION 5: ANALYSIS OF IMPACTS**

The impacts of the Commission's main proposals are summarised for each of them. The Commission services have used a cost-benefit analysis to assess and quantify where possible the impact of the proposed policy options.

### **5.1. Further TSO unbundling**

#### No EU action

The consequences of no EU action or "business as usual" scenario have been described at length in the Commission Communication of January 2007, notably in the energy sector inquiry. The main issue is that vertically integrated companies have a disincentive to behave in a pro-competitive manner. The Commission services have identified problems of foreclosure and abuse of dominant position by established players. Restrictions to market entry and market integration would persist, should the regulatory status quo continue.

Existing legislation requires that network operations are legally and functionally separated from supply and generation or production activities. Member States have complied with this requirement by applying different organisational structures. Several Member States have created a totally separated company for network operation, others have created a legal entity within an integrated company. The requirements of legal and functional unbundling have indeed positively contributed to the emergence of competitive electricity and gas markets in several Member States. However, experience has shown that where the transmission system operator is a legal entity within an integrated company, three types of problems arise.

Firstly, the transmission system operator may treat its affiliated companies better than competing third parties. In fact, integrated companies may use network assets to make entry of competitors more difficult. The underlying reason is that legal and functional unbundling do not solve the fundamental conflict of interest within integrated companies whereby the supply and production interests aim to maximise their sales and market share while the network operator is obliged to offer non-discriminatory access to competitors. This inherent conflict of interest is almost impossible to control by regulatory means as the independence of the transmission system operator within an integrated company is impossible to monitor without an excessively burdensome and intrusive regulation.

Secondly, under the current unbundling rules, non discriminatory access to information cannot be guaranteed as it cannot be effectively prevented that transmission system operators do not release market sensitive information to the generation or supply business of the integrated company.

Thirdly, investment incentives within an integrated company are distorted. The vertically integrated network operators have no incentive to develop the network in the overall interest of the market with the consequence of facilitating new entry at generation or supply levels. Instead, the investment decisions of vertically integrated companies tend to be biased to the needs of supply affiliates. Such companies seem particularly disinclined to increase interconnection or gas import capacity which allow for more competition in the incumbent's home market to the detriment of the internal market.

### *5.1.1. TSO unbundling micro-economic impact analysis*

In view of the fundamental nature of any future requirement to fully separate networks in terms of ownership, the Commission services have made a detailed economic analysis of the effect of such a measure in terms of:

- the effect on network investment
- the effect of investment in LNG terminals
- the effect on share prices and credit ratings
- the effect on market concentration
- the effect on prices
- the effect on relations with external suppliers and security of supply
- the effect on research and innovation.

Finally case studies are made comparing experience with the ISO models against ownership unbundling.

### *5.1.2. Impact of ownership unbundling on investments in the network*

Experience from several Member States demonstrates that ownership unbundling is conducive to infrastructure investment, thus correcting the distorted investment incentives of vertically integrated companies which have no incentive to develop the network in the overall interest of the market with the consequence of facilitating new entry at generation or supply levels.

While it is difficult to compare the absolute investment levels across the EU due to country specific characteristics such as population density and primary energy sources it appears worthwhile comparing the evolution of TSO investment over time, in particular in Member States where ownership unbundling has occurred. Such an analysis shows that the TSOs for which data was available show a significant and constant increase in investment levels after ownership unbundling took place (see Annex III). Three to four years after the ownership unbundling the investments in the networks had doubled, in the case of some TSOs, i.e. Spanish REE, Czech CEPS, Portuguese REN and Dutch Gasunie, the increase in the investment amount was even more pronounced. Notably, this observation can be made for TSOs in both the gas and the electricity sector.

In the case of vertically integrated TSOs, there is generally less data on network investment publicly available (see Annex III). The available data for some German, French and Italian TSOs show an increase in network investment in recent years, however less pronounced than in the case of the above mentioned TSOs after ownership unbundling. For instance, the network investment of the German electricity TSOs, which are all part of integrated energy companies, halved between 1995 and 2002/2003 and has only recently shown signs of recovery.

It should be noted that tariff regulation also exercises an important influence on the TSOs' willingness to invest as it is an important factor for the profitability of their investments. Part

of the steep increase in investments after ownership unbundling may therefore be explained by a stronger willingness of regulators to finance the investments through tariffs. The independence of ownership unbundled TSOs from supply and generation interests is, however, likely to have contributed to the regulators' willingness to finance the investments through tariffs. Another factor influencing investment decisions is the conclusion of long-term supply agreements. These reduce investors' risk that the infrastructure will not be used adequately. There are however no indications that this factor would in recent years have influenced investment level in any particular manner.

Investment in interconnectors may be regarded as a particularly suitable indicator to examine the potential of ownership unbundling to promote investment. The reason is that vertically integrated companies have an interest to protect their supply business in their home market by limiting cross-border capacity. As shown in the below table, the share of congestion revenue reinvested in interconnector capacity was about twice as high for ownership unbundled TSOs as for vertically integrated TSOs.

### Relationship between ownership of TSOs and reinvested congestion revenue

|  | Ownership unbundled TSOs in EU-15 | Vertically integrated TSOs in EU-15 |
|--|-----------------------------------|-------------------------------------|
| Congestion revenue (2001-6/2005)       | 387                               | 623                                 |
| Interconnector investment              | 129                               | 104                                 |
| Share of reinvested congestion revenue | 33.3%                             | 16.8%                               |

Source: Energy sector inquiry

It should be noted that these results need to be interpreted with caution because, firstly, interconnector investment is influenced by a number of factors and not only by the unbundling, secondly, investment planning and implementation takes some time and, thirdly, situations in which an ownership unbundled TSO at one side of the border faces an integrated TSO at the other side of the border can be an obstacle to investments. This being said, these caveats apply to all TSOs in an equal manner and should not systematically influence the above findings.

The case of the Nordic countries is another example of how ownership unbundled electricity TSOs have agreed to tackle cross-border congestion.<sup>8</sup> In the framework of Nordel, the body for co-operation between the TSOs in Denmark, Finland, Iceland, Norway and Sweden, the TSOs have identified five major cross-sections in the Nordic transmission grid which will be substantially reinforced in the coming years. The total investment volume of all five project is about €800 million.

As stated in the energy sector inquiry, the German electricity TSOs which are all part of vertically integrated companies have invested only a small fraction of their revenues from cross-border congestion into expanding or building new cross-border interconnectors: *"In the period 2001 to 2005 three German TSOs managing interconnectors generated congestion revenues of [400-500] million Euro. Of these revenues only [20-30] million Euro were used*

<sup>8</sup>

<http://195.18.187.215/docs/2/PAOPOIHDHNMDBAHIFCCFFILNPDBN9DB62Y9DW3G74HS/Norde1/docs/DLS/2006-00351-01-S.doc>

to reinforce/build new interconnectors (one TSO said that it does not know how much of the investment into the net had the effect of reinforcing interconnectors). All TSOs maintained that the remaining revenues were used to reduce the transmission tariffs."<sup>9</sup> While it must be acknowledged that building a new line is a difficult and lengthy procedure, the striking findings in the case of the German TSOs seem to confirm the view that unlike ownership unbundled TSOs vertically integrated companies have little incentive to invest in interconnectors which risk to expose them to more supply competition in their home market.

### 5.1.3. Impact of ownership unbundling on investments in LNG terminals

With respect to investment, it is also important to note that the main Member States in which LNG terminals are in an advanced stage of planning or are being built by companies other than integrated energy companies are the Netherlands, the UK and Spain, i.e. countries in which the gas networks are ownership unbundled. Moreover, in these three Member States the number of LNG terminals being close to construction phase or being constructed has been significantly higher than in countries in which the gas TSOs are still part of integrated companies. This is particularly so when taking into account projects by companies not affiliated with the incumbent companies.

These findings are in line with the Commission's energy sector inquiry which concluded that *"traditionally LNG has been imported by national incumbents who also own LNG terminals, which has not permitted the potential of LNG imports to increase downstream competition to be realised. Recent trends, however, point to more capacity going to new entrants and to producers themselves. This is likely to have a positive impact on fostering downstream competition unless such effects are frustrated by access, LNG-storage or emission rules with negative effects on competition, or by anti-competitive behaviour."*<sup>10</sup>

### 5.1.4. Impact of ownership unbundling on share prices

The Commission has analysed the impact of ownership unbundling on the share value of previously vertically integrated energy companies. The analysis has been triggered by fears that ownership unbundling allegedly destroys shareholder value by forcing the break up of companies. In this perspective, ownership unbundling has been considered to correspond to an 'expropriation' of the shareholders. The following examples show that shareholders have in fact in almost all cases benefited from increasing share prices during and after the ownership restructuring.

Three Member States appear particularly suitable to investigate this impact. These are Spain for its gas and electricity TSOs Enagas and REE, Italy for its electricity TSO Terna and the UK for National Grid which is both the TSO for gas and electricity. These TSOs are ownership unbundled, the majority of the shareholding is in private ownership and they are listed on the stock exchange. As a general rule, the share prices of all four TSOs as well as the prices of their previous owners display a massive increase. Generally, the TSOs clearly outperform the national stock market indices as well as their former parent companies, however, the latter still outperform the national stock market indices or display at least a comparable performance (see all relevant graphs in annex).

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<sup>9</sup> Energy Sector Inquiry, page 180.

<sup>10</sup> Energy Sector Inquiry, page 282.

To illustrate the share value evolution at the example of British Gas: On 14 February 1997, immediately before the demerger of Centrica, British Gas shares closed at a price of 247.5p. If you had bought 100 shares at that price and had subsequently reinvested all dividends and returns of capital you would now hold 126 BG Group shares, worth 739p each, 125 Centrica shares, worth 373.5p each, and 60 National Grid shares, worth 795.5p each. Thus an investment of £100 would now be worth £756.05. On the same basis £100 invested in the FTSE 100 would be worth £197.45. In the case of Scottish and Southern Energy and Scottish Power, the introduction of an independent system operator in Scotland in 2005 does not seem to have had a negative effect on the share price which, on the contrary, has increased substantially since 2005.

In Spain stock prices for Iberdrola, Endesa and Union Fenosa, which sold their electricity network assets at the end of 2002, and TSO Red Electrica de Espana (REE) increased by up to 600% (for the period November 2002 to April 2007), compared to an increase of the Spanish stock market index IBEX 35 of 68% over the same time period. Similar patterns can be found for the unbundled Spanish TSO Enagas and its former vertically integrated parent Gas Natural.

In the case of Italy, the share price of the incumbent electricity company ENEL was in the period from June 2004 to March 2007 developed similar to the evolution of the general stock market index even though during this period, ENEL gradually divested its network company Terna to a remaining shareholding of presently 5% (sale of 50% of Terna in July 2004, 13.86% in March 2005 and 29.99% in September 2005). During the same period, Terna outperformed the Italian stock market.

#### *5.1.5. Impact of ownership unbundling on credit ratings*

Comparing the credit ratings of vertically integrated companies to energy companies without network assets, no significant or systematic differences can be observed (see Annex VI). This seems to provide some evidence against the common view that the predictable revenue stream of the network business makes a vertically integrated companies less risky than a company without network assets, allegedly giving it cheaper access to investment capital.

It appears that the particular financial situation of the individual companies, their private or public ownership, the degree of international expansion and country specific circumstances play a much more important role in explaining the differences in the credit ratings than the level of vertical integration. It is also worth noting that the credit rating for National Grid's gas TSO is the same as for its former parent Centrica. In fact credit ratings before and after this ownership unbundling did not change at all. Likewise, in the case of ENEL, the divestiture of the Italian electricity TSO Terna in the years 2004 and 2005 changed nothing in ENEL's A+ rating by Standard & Poor's.<sup>11</sup> The same is true for the Spanish gas supplier Gas Natural which, between 2002 and 2005, was obliged to gradually divest its gas network without experiencing any effect on its credit rating.

#### *5.1.6. Impact of ownership unbundling on market concentration*

Market shares of the largest generator in the electricity market (as a percentage of total generation) are significantly higher in Member States with legal unbundling than in those with

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<sup>11</sup> Source: Standard & Poor's, in particular S&P Commentary Report: EU Energy Policy Review To Map Out Future Direction For European Utilities, 10 October 2006.

ownership unbundling. Abstracting from countries with incomplete data, small and isolated countries, and the special case of Germany (where four former regional monopolists dominate the market), average market shares of the largest generator were in 2005 in Member States with legal unbundling 73% versus 47.7% in Member States with ownership unbundled TSOs (see table in Annex II).

While it is true that this difference already existed to a large extent before some of the Member States concerned implemented ownership unbundling, the cases of Spain, Italy and Portugal demonstrate that the market shares of the largest generator dropped significantly following the implementation of ownership unbundling. In all three countries, the market share of the largest generator fell, within three years after ownership unbundling, by more than six percentage points. In more general terms, the degree of market concentration as measured by the market share of the largest electricity generator decreased between 1999 and 2005 more strongly in Member States with ownership unbundling than those with legal unbundling.

In the gas sector, ownership unbundling has equally led to an erosion of the incumbents' market share. In particular in the UK and Spain, the wholesale market shares of the incumbent companies such as British Gas and Gas Natural have fallen below 50%.

#### *5.1.7. Impact of ownership unbundling on prices*

Electricity and gas prices may not automatically decrease because of ownership unbundling as other elements such as rising commodity prices, investment costs, taxes and environmental fees may exert a strong upward pressure on prices. However, weakening the market power of vertically integrated companies has potentially a dampening effect on prices by encouraging efficiency and new entry. In any event, the objective of ownership unbundling is not necessarily to bring prices down but to achieve a price setting which reflects the real costs of efficient operation and which gives the right signals for the future investments needs, for example in renewable energy.

A possible approach to examine the impact of ownership unbundling on energy prices is to compare the price evolution of Member States with and without ownership unbundled TSOs. Such a comparison has been carried out on the basis of biannual Eurostat price data for wholesale and household customers in EU-27 excluding all taxes. Based on the entry into force of the first electricity Directive, the year 1998 was chosen as the starting point. As of the moment a Member State implemented ownership unbundling, the relative price change of this Member State was included in the calculation of the price index for Member States with ownership unbundling. This methodology takes into account that the composition of Member States that apply ownership unbundling is changing over time and that price data for the newer Member States is not available for all years.<sup>12</sup>

The results of this calculation show that in ownership unbundled markets, the electricity price for industrial consumers decreased from 1998 until 2006 by 3.0%, while in markets without ownership unbundling this price increased by 6.0%. The price difference between the two country samples over the entire period of nine years was thus 9% in favour of Member States with ownership unbundling (see table below and detailed table in Annex VII).

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<sup>12</sup> At the beginning of the period the electricity price evolution is calculated on the basis of three Member States, while the indexes for 2005 and 2006 are based on data of 13 Member States.

Household electricity prices show an even larger difference between countries with and without ownership unbundling. In countries with ownership unbundling, household electricity prices rose from 1998 until 2006 by 5.9%., while the price increase in countries without ownership unbundling was 29.5%. The difference between the two country samples was thus 23.6% in favour of Member States with ownership unbundling (see table below and Annex VII).

### Cumulative and aggregated electricity price changes in EU-27 for the period 1998-2006

|   | Electricity prices           |                         |                              |                         |
|---|------------------------------|-------------------------|------------------------------|-------------------------|
|   | Industry                     |                         | Households                   |                         |
|   | MS with ownership unbundling | MS with integrated TSOs | MS with ownership unbundling | MS with integrated TSOs |
| Cumulative and aggregated price changes 1998 - 2006 | -3.01%                       | 6.01%                   | 5.91%                        | 29.46%                  |

Source: Eurostat data, own calculations; all prices without taxes, see also Annex VII

It should be noted that the comparison of the evolution of household prices is *prima facie* less meaningful than for industry prices since, in the period under examination, numerous Member States have applied regulated tariffs for household customers. Household prices are thus less sensitive to changes in market conditions.

Moreover, it is not possible to carry out the same comparison for gas prices. For most of the period since 1998, there was only one Member State which had a fully ownership unbundled gas TSO, namely the United Kingdom since 2000. While the UK household and industry gas prices developed subsequent to unbundling more favourably than in the total of other Member States the statistical basis is too small to be representative.<sup>13</sup>

Another indicator to measure the level of competition in a market is the margin between wholesale prices and retail prices. The higher this margin, the more retail suppliers benefit and the more end customers have to pay for their electricity. In the Netherlands and the UK, the wholesale prices for electricity were in 2006 consistently higher than in Germany. However, retail prices were lower in the Netherlands and the UK. In fact, the price margin in Germany was twice as high as in either the Netherlands for both large and small industrial customers. This observation appears to indicate that some surplus has been kept by the vertically integrated incumbent companies due to lack of competition in retail supply leading to higher supply margins.

<sup>13</sup> It is only as of the year 2005 that there is price data for more than two Member States with ownership unbundling.

## LARGE INDUSTRY ELECTRICITY PRICES

| <b>Euro/MWh</b>                          | <b>DE</b> | <b>NL</b> | <b>UK</b> |
|--|-----------|-----------|-----------|
| Industry end user prices (Eurostat) 2006 | 77        | 61        | 68        |
| Average wholesale market price 2006      | 53        | 65        | 57        |
| Price margin                             | 24        | -4        | 11        |

## SMALL COMMERCIAL ELECTRICITY PRICES

| <b>Euro/MWh</b>                     | <b>DE</b> | <b>NL</b> | <b>UK</b> |
|-------------------------------------|-----------|-----------|-----------|
| SME prices (Eurostat) 2006          | 163       | 120       | 111       |
| Average wholesale market price 2006 | 53        | 65        | 57        |
| Average wholesale market price 2006 | 110       | 55        | 54        |

It should be noted that these data need to be interpreted with caution as they concern only three Member States in one year.<sup>14</sup> However, making the more conservative assumption that the price margin in Germany could be €15/MWh lower than currently, thus reducing somewhat the difference to the lower margins in the Netherlands and the UK, the potential savings for German customers would be €7.5 billion based on the annual electricity consumption in Germany of about 500 million MWh. Extrapolating such findings to all Member States without ownership unbundling could potentially yield to savings of another €5 to 10 billion.

Customers in the EU-15 Member States realised in the period from 1998 until 2004 cumulative price savings from electricity liberalisation of the order of about €60 billion.<sup>15</sup> In the case of gas, prices decreased only the years 1998 and 1999. As EU gas prices are more strongly influenced by external factors such as primary resource markets and the oil-gas price link, it is in any event more difficult to relate the success of gas market liberalisation to the price evolution. In any case, the experience with past liberalisation in particular in the electricity sector suggests that additional competitive pressure is likely to have a positive influence on prices. More analysis of the effect of further liberalisation on the energy prices is

<sup>14</sup> It should also be noted that the table on "Large industry electricity prices" shows a negative price margin for the Netherlands. This situation is not sustainable in the long run as it means that the companies were on average making losses.

<sup>15</sup> This sum is arrived at by multiplying the decrease in the biannual household and the industry electricity prices relative to the level of the first half year 1998 with the respective electricity consumption figures. Based on Eurostat price and consumption figures for households and industry.



presented below in section 5.13 on macroeconomic impacts. 5.1.8. Impact on security of supply and control of third country investment

Some concern has been expressed that the proposed unbundling measure might have negative repercussions on security of supply, in particular for gas in the light of the market concentration of external upstream suppliers. The Commission services have considered these arguments and do not find any negative impact arising from the proposed measures.

Firstly, the EU internal market will serve to reduce dependence of individual Member States on particular external suppliers. A more integrated network that would result from better TSO cooperation and ownership unbundling would make an important contribution in this respect. In order to achieve the internal market it is necessary that gas can be freely moved around the European Union either in physical or in virtual form. TSOs which are independent of supply and production interests can be expected to facilitate such arrangements by facilitating investment in transport capacity.

Secondly, in an integrated market, external suppliers would be more likely to be faced with a smaller number of large and powerful EU-wide energy companies rather than 27 small national ones. These companies would:

- have the financial strength to negotiate with external suppliers without needing to own the network,
- represent a very large portfolio of customers,
- have access to a wider range of alternative resources (LNG, North Sea gas etc.),
- be more efficient and commercially focused than state-owned national incumbents.

Generally, investment in the gas and electricity networks in the EU is highly welcome as these networks are in need of renewal and expansion in order to accommodate for new types and sources of primary energy. In this respect, also third country investments can under certain conditions be regarded as beneficial. It is only where the involvement of third country companies undermines the effective TSO unbundling or where the investment is driven by other motives than economic ones that the investment may counteract the pro-competitive effect of the unbundling and run counter to security of supply considerations.

The concern about third country investment is expressed mostly in relation to gas networks since third countries already have strong positions in the gas supply to the EU. The general concern that the benefits of more effective TSO unbundling might be undermined through vertically integrated companies from third countries applies, however, equally to the electricity sector. Currently about one third of the EU gas transmission networks are majority state-owned. Among the privately owned gas transmission networks, Gazprom holds minority participations in transmission networks in several Member States, for example in all three Baltic States, Finland and Germany. There are also state or privately owned funds and companies from other third countries which hold minority participations in the EU gas infrastructure (see Annex VIII).

Two general approaches are conceivable to control third country investment in EU networks. Firstly, a restriction of the *ownership of* and *control by* third country companies in EU

networks. This approach has to take into account the international obligations of the Community and the Member States *vis-à-vis* third countries as well as the internal market principles of non-discrimination and the free movement of capital. Secondly, a *regulatory* approach can be envisaged whereby the independence of a candidate TSO is monitored at national and/or European level, for example, in the framework of a certification procedure for TSOs. Since the independence of non-EU investors is more difficult to detect it appears necessary to require the candidate TSOs concerned to demonstrate their independence from supply interests. In any event, ownership unbundling would ensure that EU gas and electricity networks, which may be considered strategic assets, can be owned neither by EU nor by non-EU supply companies.

Any approach chosen needs to avoid the situation that individual Member States feel under pressure to agree to certain deals on a case-by-case basis without taking account of the wider European interest to ensure security of supply.

#### *5.1.9. Case Studies: Compared impacts of OU and ISO*

The best known example of an existing ISO in the EU is the Scottish ISO for electricity. Since 2005, National Grid (NG) operates the networks of the two vertically integrated electricity companies Scottish Power (SP) and Scottish & Southern Energy (SSE). NG is at the same time the electricity TSO in England and Wales and the gas transmission system operator in all of Great Britain owning the respective networks. The relationship between the ISO and the network owners is laid down in an agreement of about 200 pages: “The System Operator Transmission Owner Code”.

Contrary to 3<sup>rd</sup> package proposals, the asset owners, i.e. the vertically integrated companies, have considerable influence on investment decisions and maintenance of the network. The ISO is mainly responsible for day-to-day operation and can only comment on the investment plan.

SP and SSE promote the ISO solution while NG, Ofgem and the UK Department of Trade and Industry express a more reserved position. A common criticism is that the ISO is only a second best solution to ownership unbundling and only functions reasonably well in Scotland because some particularities:

- (i) the Scottish electricity market is relatively small and largely isolated from the rest of the UK. The grid is therefore relatively easy to manage;
- (ii) NG is an experienced, ownership unbundled TSO in the neighbouring area guaranteeing its independence and preventing “cross-border” problems and
- (iii) Ofgem is a strong regulator closely monitoring the relationship between the ISO and the asset owners.

**Italy** introduced an ISO model in the electricity in 1999, based on the following principles:

- operating and planning the development of the national transmission grid was entrusted to an ISO (GRTN), a public operator fully controlled by the Ministry of Economic Affairs and Finance;
- ownership of network infrastructure and related activities, such as lines construction, remained in the hands of the generation companies.

In this model, the ISO responsible for transmission, dispatching and grid development activities coexisted with several TSOs responsible for operations, maintenance and development activities related to the national high-voltage network under supervision of the ISO. Since the ISO was responsible for dispatching and not directly related to the incumbent, it was supposed to remain neutral while being involved in network development by drawing up an investment plan, in accordance with the Ministry of Industry, to detect and remove congestion caused by bottlenecks. The investments necessary to develop the network, planned by the ISO should have been made by the TSOs via a tendering procedure.

However, inefficiencies and difficulties emerged in the coordination between the operator and owners of the grid. This led the Government to propose the “re-bundling” of transmission system ownership and operation in November 2005 with the creation of a single TSO called Terna. Terna is now a listed company in which ENEL is a shareholder (6% of shares).

Even if the effects of the TSO ownership unbundling in Italy will be only fully measurable in the coming years, some changes can already be mentioned:

- the new investment plan, for the following 4 years, shows an increase of 30% compared to the ISO investment plan;
- the number of authorisations obtained doubled in the last three years, partially due to the ISO/TSO;
- Since the ISO was not managing the budget for the construction of the new lines, it could afford only a very small department for planning (three people). After ownership unbundling, the new department in charge of planning and construction employs about 100 people.
- more investments are planned in the Southern regions and islands, where most of the bottlenecks are located and new generation capacity is expected;
- strong reduction in operational expenditure, partially due to the in-sourcing of GRTN.

In **Switzerland**, the seven regional, vertically integrated electricity companies set up at the beginning of this year the common transmission network operator Swissgrid responsible for the day-to-day operation of the grid. This ISO is only a temporary solution because it is envisaged to transfer the network assets to Swissgrid turning it into a TSO owning its own network.

In the **United States**, there are several ISOs. Generally, the ISO models in the US suffer from a lack of investment in generation and transmission. **PJM** (originally covering Pennsylvania, New Jersey, Michigan) is the oldest and best known ISO example in the US. PJM can be considered a “deep ISO” because it ultimately decides on investment after having developed a transmission expansion plan and having a crucial say on who executes the investment. The governance structure of PJM is very complex. It is owned and governed by its about 450 members which are generators, transmission owners, suppliers and traders, distributors and large end-users. The members determine a board of independent executives.

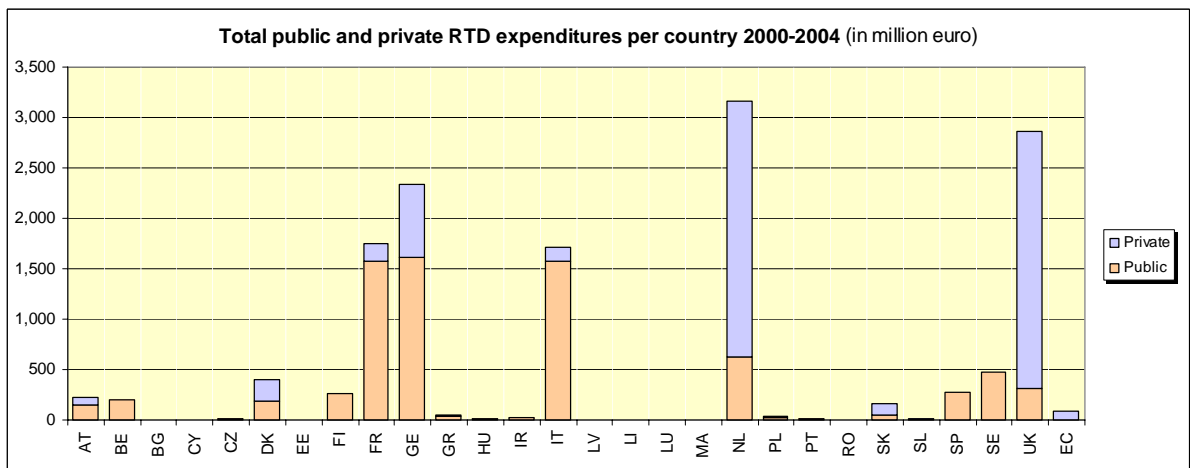
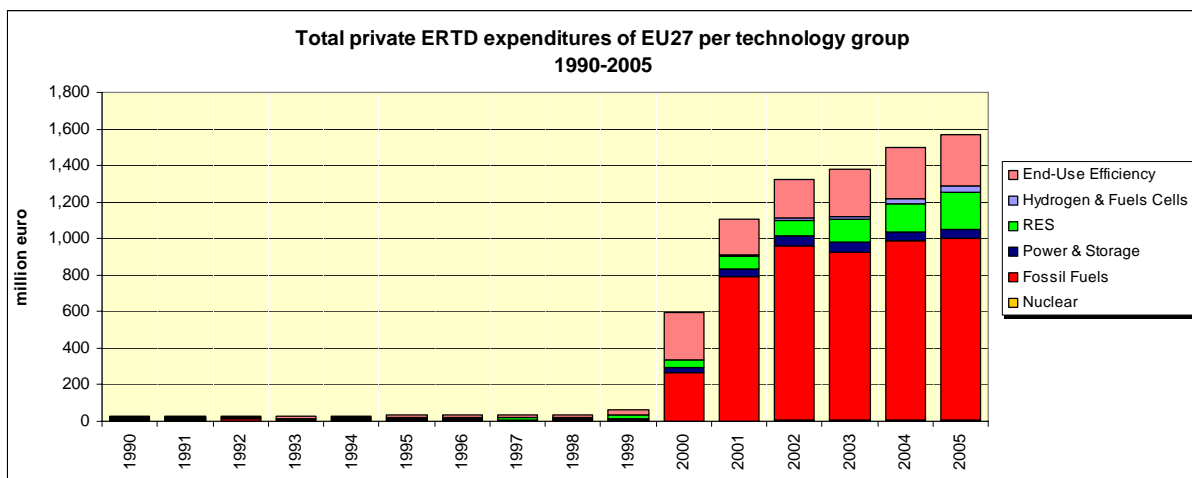
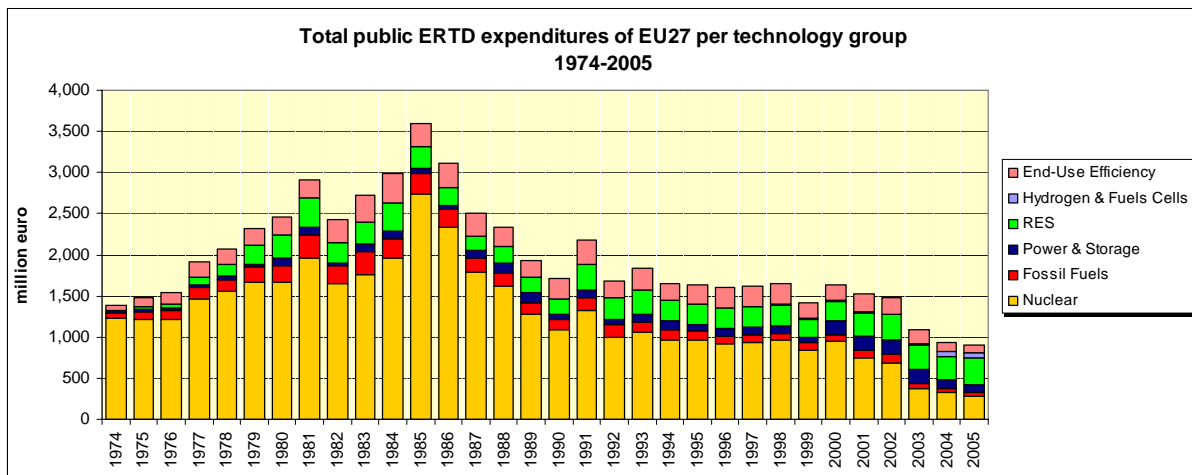
#### *5.1.10. Impacts on Research and Innovation*

It must be stressed that any kind of unbundling will not be sufficient alone to remove the barriers to research and innovation on the electricity system. What is necessary is for both Regulators and Network Operators to think long term and European.

Ownership unbundling tends to give more financial/human resources to TSOs and a more long term prospective to the business, and therefore makes them more sensitive to the needs of research and innovation.

Ownership unbundling will make it much easier to setup a system of regulations capable to send the right economic signals, ie regulation which will reward network operators for the proper long term functioning of the EU electricity system – including the effective integration of new energy sources.

While it is difficult to attribute increased research expenditures to single factors, open competitive markets seem to support innovation and research in energy.



Source: JRC (2007, unpublished data; all numbers in million €)

### Conclusion

On the basis of the foregoing analysis, it appears that the option of full ownership unbundling has a number of positive impacts on the market, in particular by stimulating investment in particular in interconnectors, reducing market concentration and bringing down prices. At the same time, the potentially negative effects cannot be observed, that is there is no indication

that ownership unbundling would harm credit ratings, share prices, R&D activity or the relationship with external suppliers. Finally, ownership unbundling would ensure that EU energy networks cannot be owned by non-EU supply companies, nor by EU suppliers.

There is generally less empirical evidence relating to the functioning of ISOs because there are only a few examples of this model in the EU. The available information shows that this option does in any event not negatively affect some key parameters of the companies concerned, notably the credit ratings and the share prices of such companies.

## **5.2. Enhancing the role of national regulators**

### No EU action

The business as usual scenario would see no change in the current imbalance of powers between national regulators. The way in which the previous Directives have been implemented mean that the "referees" of the liberalisation game have extremely different possibilities to make that the rules are respected by all players. In addition, the independence of some regulators, in particular vis-à-vis political interference, has already been questioned in a number of EU Member States.

### Option

The experience of those Member States where markets are open for several years as well as the example of most utility sectors open to competition clearly indicate that strong regulators are absolutely necessary to ensure a proper functioning market, in particular as regards the use of network infrastructures.

Existing legislation requests that Regulatory authorities shall be wholly independent of the interests of the gas and electricity industry. However, it does not specify how independence shall demonstrably be ensured and it does not guarantee independence from political interests.

Political independence of regulators will ensure market confidence in impartiality. In addition, the fact that powers of regulators are harmonised in an EU legislative text, leaving only the necessary room for tailoring to national needs, will ensure a coherent enforcement system across the EU. Market functioning should also benefit from strong, independent regulators, helping to boost the EU competitiveness in line with the Lisbon strategy.

More regulator powers probably will have no significant effect on private sector compliance costs. In fact regulators get more power to enforce what is already required from the current Directives.

Strengthened regulator powers may decrease market distortions resulting in more competitive energy markets. However some stakeholders (mainly incumbents) expressed doubts regarding the necessity and proportionality of an extension of such measures.

The considered strengthening of regulator powers will enlarge regulator options for effective consumer protection.

Increasing regulatory oversight over operational decisions of companies active in the energy business, will prevent market abuse and create confidence in the market. By providing increasing regulatory oversight on supply and demand, suppliers will be able to rely on wholesale markets to determine the price for their customers and to decide on investments in

for example power plants. Reliable pricing will lead to liquid markets where suppliers can hedge their risks and optimise their supply portfolio. This will increase efficiency that will lead to lower costs.

Trading in commodities is currently not covered by other legal instruments like the Markets in Financial Derivatives Directive, except for a limited scope related to the type of traders (e.g. banks), and it is unlikely to be covered in the near future. Moreover, electricity and gas are network-based products with inelastic demand which differ fundamentally from other commodities. It could therefore be useful and justified to develop record keeping and trading rules for spot and future markets for gas and electricity which take account of the specificity of these sectors. When developing record keeping obligations and transparency requirements for these markets it needs to be ensured that these requirements are consistent with the more general regulation for financial markets.

Regulatory oversight will prevent excessive speculation that leads to higher prices at the detriment of consumers and benefit of speculators. A recent report by the US Senate on the speculation of the Amaranth hedge fund concluded that, due to lack of regulation and transparency in gas trading, the company was able to drive up prices that lead to companies going bankrupt and consumers receiving higher gas bills. The report quotes for example the Municipal Gas Authority of Georgia (MGAG), which serves 230.000 customers in southern USA, paying \$ 18 million more than the actual market prices during the winter of 2006-07 because it bought the contracts on the forward market when the price was driven up by Amaranth's speculative behaviour. The reports states that 'MGAG officials characterized the extra \$ 18 million, which resulted in higher natural gas bills for their customers, as a "premium" forced on them by excess speculation in the market by Amaranth and others.'<sup>16</sup>

The public sector cost of regulation may increase, in some Member States, but the increase is small in absolute terms. Regulators need additional staff, housing, management, IT, etc. Notification of certain regulator decisions to the Commission will lead to (rather low) extra costs for the regulator and for the Commission. Others think the direct costs of extra powers to be small or negligible. An ERGEG member believes that probably no net costs are involved if effective sanctions are included. This may reduce the duration and number of appeals.

The Commission services estimate the additional powers granted to regulators may lead them to increase their staff by 5 to 10%. The overall cost in this hypothesis would approximately be 10 to 15 million euros per year for the whole of the EU, which seems proportionate or even negligible against the overall benefit expected from improved market functioning.

Concerning the costs of improved coordination, changing the regulatory structure would cause the central costs regulation to go up to a limited extent whereas the regulatory costs in member states may (in the long run) go down. In general the Commission services expect that additional powers will in all cases increase the costs of regulation whereas enhancing the effectiveness and deterrence of regulation as well as streamlining the appeal procedures may result in possibilities to control the costs of regulation. The net effect to be expected will depend of the configuration of the revised package and the way a revised package is implemented in the Member States.

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<sup>16</sup> Permanent Subcommittee on investigations – Chairman Senator Carl Levin, Excessive Speculation in the natural gas market, Released in conjunction with the permanent subcommittee on investigations June 25 & July 9, 2007 Hearings, United States Senate

### 5.3. Co-ordination of regulators at EU level

#### No EU action

An independent advisory group on electricity and gas, called the "European Regulators Group for Electricity and Gas" (ERGEG) was established by the Commission in 2003 to facilitate consultation, coordination and cooperation between the regulatory bodies in Member States, and between these bodies and the Commission, with a view to consolidating the internal market in electricity and natural gas. This group is composed of representatives of the national regulatory authorities.

ERGEG activities in the last years very positively contributed to the completion of the internal market in gas and electricity by issuing non-binding guidelines and addressing recommendations and opinions to the Commission.

However, most stakeholders, as well as the regulators themselves, consider that the development of the internal markets calls for a formal mechanism for national regulators to cooperate and take decisions on important cross-border issues. In particular, it is widely recognised that regulators should be in a position to take a more European approach. The baseline scenario would lead to persistent diverging decisions of national regulators in similar situations, jeopardising the completion of the Internal Market together with investors' confidence.

#### Options

With respect to increased regulatory coordination at EU level, the impact is difficult to assess since it is not easy to quantify the potential synergies of enhanced coordination which may come from cost advantages due to economies of scale. No underpinning studies are available on this aspect. In general, regulatory decision-making regarding certain regulatory issues (in this case international infrastructure investments) is expected to be carried out most efficiently at the level corresponding to the geographical scope of the project (e.g. regional or EU-wide). Compared to the current situation, this would imply a decrease in overall regulatory costs for projects having a supra-national scope. The risk lies in the creation of a new coordination mechanism *next to, or on top of* existing arrangements. This would imply an increase in regulatory costs upon implementation of the proposed policy measures.

Private sector compliance costs may rise. This is dependent on the ability (politically) to fully transfer certain regulatory tasks related international infrastructure investments to higher levels. When this is successfully done, compliance costs may stay at the same level, but when only partial delegation of tasks is realised, an increase in costs may result following 'double compliance requirements': at the national and the regional/EU level.

#### Setting up an agency

The Commission also evaluated the impact of the setting up of an agency, against a number of criteria:

- Problem which must be resolved and the need which must be met in the short or long term:

By law, national energy regulators have competences to regulate their national markets. Nevertheless, the integration of each national market in order to build the EU internal market requires now to act at EU level for certain types of decisions. This is clearly advocated by the



experience gained in the implementation of the 2003 directives and there is a consensus among the stakeholders that time has come to propose an independent mechanism for national regulators to cooperate and take decisions at EU level (the European Agency for the Cooperation of Energy Regulators). Although, the internal market for energy has developed considerably, a regulatory gap remains on cross-border issues.

As time has progressed the issues have become more complex and detailed, and involve to a greater and greater extent different financial interests. The present approach, which at the end of the day requires the agreement of 27 regulators and more than 30 transmission system operators to reach agreement, is no longer producing sufficient results. It has led to a number of non-binding codes and efforts to reach agreement on common approaches through "gradual convergence" but has not proven able to lead to real decisions on the difficult issues that now need to be taken to make the single market a reality.

At present the technical rules that electricity companies must operate under, "grid-codes", differ enormously between Member States and often within a single Member State. Often these differences have in the past been introduced by the vertically integrated company arguable with the object, but certainly with the effect, of isolating their national market. In order to arrive at first regional markets and then an EU one, these need to undergo a process of convergence and then harmonisation.

For example, if today an Italian company wishes to buy electricity in Germany, it must first acquire transmission rights from numerous companies, each of which operate different rules for capacity allocation, balancing, injection and contracts. Only real specialists (i.e. the incumbent themselves) can in reality do this.

In order to tackle the issue, the Commission started with self-regulatory forums like the Florence and Madrid forums. In addition, in 2003 an independent advisory group on electricity and gas, called the "European Regulators Group for Electricity and Gas" (EREG) was established by the Commission to facilitate consultation, coordination and cooperation between the regulatory bodies in Member States, and between these bodies and the Commission. This group is composed of representatives of the national regulatory authorities. EREG contributed positively to the completion of the internal market in gas and electricity by issuing non-binding guidelines and addressing recommendations and opinions to the Commission.

Thus, most stakeholders, including the regulators themselves, consider that the development of the internal markets calls for a formal mechanism for national regulators to cooperate and take decisions on important cross-border issues.

- Added value of Community action; alternatives to the creation of a European regulatory agency

a. Could these new tasks have been pursued by the Commission itself? Regulatory activities require highly technical skills, notably knowledge of the physics of the grid, levels of investment needed in the sector (generation and transmission), elaboration of access tariffs and dispute settlement mechanisms. These tasks require very specific technical expertise that the Commission does not have. It requires in addition expertise of all these issues in the 27 different Member States. Acquiring the necessary expertise would go beyond the creation of a new directorate inside the Commission. Moreover, only a body emanating from the national regulators can catalyse all the necessary resources of national regulators that is fundamental to achieving success on these issues. The Agency can through its Regulatory Board – which exists of NRA's- call upon the staff of these NRA's. The Commission is not in that position –

NRA's would never put their resources at the disposition of the Commission; on the grounds of their independence. In addition, it is not a task that falls within the Commission's sphere of activities. The Commission has never carried out this activity, it would not be able to separate the regulatory and legislative tasks, and it would transform the Commission's institutional role towards a more technical body, without gaining any benefit from such activities.

b. Would the model of the System of European Central Banks be applicable? Since this model looks very attractive, it was assessed whether this could be the preferred model. Nevertheless, the Treaty does not provide a legal basis like an Article in the Treaty, for energy.

c. The creation of a more powerful network of national energy regulators was considered. The Network of Competition Authorities created in 2004 by the Commission on the basis of the new anti-trust Council regulation n°01/2003 provides an interesting model. In that system, national competition authorities do not exert a collective decision power, but apply precise rules to define the competent authority, the exchange of information and procedures. The Commission exerts a general evocation power and may take over a case, for instance if two national regulators have conflicting views.

Transposing that system to the Energy regulators would imply:

- A reinforced regulatory power for the Commission (in particular an evocation power if, after a given period of time, national regulators fail to come to a common decision);
- Formal obligations as regards exchange of information between regulators and with the Commission;
- For the adoption of general rules, the Network could have the power to issue recommendations to the Commission for adoption in comitology;

However, it has to be noted that this system works in relation with the autonomous powers of the Commission in the competition sector. The Commission does not have such autonomous decision powers as regards the regulation of energy markets (beyond competition issues) and would therefore not have the same leverage on the network.

d. The European Economic Interest Grouping (EEIG) model

A Network of Energy Regulators could use the EEIG legal form to provide for a permanent structure or secretariat and to ease the legal and financial relationships between its members. An EEIG could be formed as a legal entity governed by public or private law and would be a suitable vehicle to receive Community funding. Since EEIG are not Community bodies, they are not bound by EC rules as regards staff and financial procedures, allowing much greater flexibility. In principle, EEIG boards decide by simple majority (each member has one vote), but certain statutory decisions need to be taken by unanimity. While the general principle of the cooperation between regulators and with the Commission could be set in legislation, the EEIG contract and internal rules could specify rights and obligations between regulators.

However, none of those four options met the objectives the Commission wants to achieve.

The nature of the tasks to be devolved to such a mechanism leads to the conclusion that it can only take the form of a regulatory agency having the possibility to adopt individual decisions which are legally binding on third parties. This option is also based on the assumption that powers of the national regulators are reinforced and harmonised.

Thus, in order to overcome the regulatory deadlock an independent regulator should be established which can take individual regulatory decisions which are binding on third parties. This was not only stated by the Commission in its January Communication, but also confirmed by the Council at the Spring Council and recently by the European Parliament in its resolutions. As explained above, such legally binding decisions can however only be taken by the Commission or by an Agency, but the Commission is typically not suitable performing these tasks in the given circumstances.

Consequently, the only solution which meets both requirements -a body which needs to be able to take binding decisions and has the necessary expertise- can only be provided by setting up a Regulatory Agency.

- It should also be stressed that the main proposed tasks should complement at European level the regulatory tasks performed at national level by the national regulatory authorities.
- *Providing a framework for national regulators to cooperate.* It is proposed to improve the handling of cross-border situations. In that role, the Agency shall also have to power to settle disputes between national regulatory authorities.
- *Regulatory review of the cooperation between transmission system operators.* It is proposed that the cooperation of transmission system operators, in particular as regards the development of market and technical codes, the coordination of grid operation and investment planning, shall be reviewed by the Agency.
- *Individual decision powers.* In a limited number of cases, it is proposed to entrust the Agency with individual decision powers. It is the case for handling exemption<sup>17</sup> requests and concerning the application of the regulatory regime both in situations where infrastructure projects are developed within the territory of more than one Member state.
- *General advisory role.* The Agency would also have an advisory role towards the Commission as regards market regulation issues, and, without prejudice to the tasks conferred to the transmission system operators; it may issue non-binding guidelines to disseminate good practices among the national regulators.
- The costs generated by control, coordination and the impact on human resources and other administrative expenditure:

One of the tasks of such an agency would be to deal with exemption decisions (under the current Article 22 of the gas Directive 2003/55/EC and Article 7 of the Electricity Regulation 1228/2003, major new infrastructures may be exempted by the Commission from third party access obligations under certain conditions).

The workload of the Agency resulting from this is expected to be significant. The Commission services only received a handful of such requests every year since the entry into force of the Directive. However, in the summer of 2007 alone, six requests have been notified to the Commission. It is reasonable to believe that the increasing number of projects for new infrastructures in gas and electricity will lead to more projects being notified.

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<sup>17</sup> As defined in Article 22 of Directive 2003/55/EC and in article 7 of Regulation (EC) No 1228/2003

The Agency would also be in charge of monitoring TSOs and their cooperation, as well as issuing binding decisions on the basis of guidelines adopted by the Commission. Last but not least, the Agency will take decisions which concern the applicable regulatory regime to infrastructures within the territory of more than one Member State. It is expected that one of the core problems, i.e. the national regulatory authorities leave a regulatory gap in the cross-border situations, should hereby be resolved.

The institutional setting and governance principles of the Agency for the Cooperation of Energy Regulators are in principle based on standard rules and practices for Community regulatory agencies.

However, the necessary independence of regulatory functions needs to be taken into account. For that purpose, besides the Administrative Board responsible for all administrative and budgetary matters, it is proposed to create a Board of Regulators, responsible for all regulatory matters and decisions. The Director, appointed by the Administrative Board, after consulting the Regulatory Board, will be chosen from a shortlist adopted by the Commission. The Director will represent the Agency and shall be responsible for the day-to-day management. In addition, the structure of the Agency foresees in a Board of Appeal, which is competent to handle appeals against decisions adopted by the Agency.

The Agency will have, given its tasks, a limited staff of 40-50 people. The number of staff is based on an extensive analysis of the staff requirements of national regulatory authorities. The proposed staff is in line with these authorities' needs, albeit put in the context of an EU Agency<sup>18</sup>. As mentioned above, if the Commission were to endeavour to perform the Agencies' tasks, the number of staff required would be much higher.

On the assumption the Agency is going to be created in 2009, the initial budget can be estimated at around EUR 2 million. After that, the annual costs are estimated at approximately €6-7 million, of which €5 million for staff expenditure (taking as the average the cost of European Commission staff, i.e. € 0.117 million per year, which includes expenditure associated with buildings and related administrative expenditure), €1 million for operational costs (meetings, studies, as well as translation, publication and public relations costs) and the rest for capital expenditures (relating to the acquisition of movable property and associated expenditure) and finally mission expenditures.

The Agency's annual costs will be covered by the Community grants. The Agency has limited revenues stemming from fees to be paid by third parties which are charged when the Agency takes certain decisions.

Within the Commission, the setting-up and follow-up of the agency would require 2-3 permanent posts, provided by reallocation of existing posts. As a comparison, energy regulators in the Member States employ a much larger number of staff compared to the figure envisaged above: 137 in Germany, 206 in Spain, 126 in France or 287 in Poland for instance.

- The system of monitoring and periodic evaluation to be established.

The legal status of the Agency should be such as to enable it to act as a legal person in the discharge of its tasks. An Administrative Board would serve as the Agency's control unit. The Administrative Board is made up of 12 members. Six are appointed by the Commission, and

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<sup>18</sup> An organigram will be attached to the Explanatory Memorandum.

six by the Council. The Agency is headed by a Director appointed by the Administrative Board for a period of five years, renewable once. The Director is the legal representative of the Agency.

There should be safeguards to secure that the Commission's position and role as a guardian of the Treaty. First of all, if the Agency takes a decision, these decisions would only be binding for specific situations explicitly foreseen in the Regulation and Directives. The Agency cannot take over the Commission's prerogative by taking general binding measures.

Secondly, if TSO cooperation or decisions by NRA's threaten effective competition and the efficient functioning of the market, the Commission should immediately be informed by the Agency and could subsequently adopt the necessary measures to remedy the situation.

Third, the Commission will have a seat in the Regulatory Board, albeit it will not have a vote in that Board.

In addition, the Commission would generally carry out after five years an evaluation of the activities of the Agency. This evaluation would cover the results obtained by the Agency and its working methods, in relation with its objective, mandate and tasks defined in this Regulation and in its annual work programmes. The first evaluation report would be presented by the Commission at the latest four years after the first Director has taken up its duties. 5.4.

#### Co-ordination between TSOs

##### No EU action

Transmission system operators in gas and electricity voluntarily cooperate in existing structures such as ETSO and GTE. They cooperate on operational issues at regional level and participate in technical bodies such as UCTE and EASEE-Gas. These multi-layer cooperation initiatives have provided a significant contribution to the internal market and have contributed to improve the efficiency and the safety of the networks.

However, a lot remains to be done to ensure the integration of the European electricity and gas markets. Should no further measure be taken, management of capacities would still be led on a purely national basis with little coordination with other Member States TSO. As a result, there would be a higher probability of capacity crisis (which may ultimately lead to blackouts in the case of electricity) and in any event artificial congestion created at the borders.

##### Option

Public sector costs would be limited to the introduction of new regulation and therefore are low. The private sector compliance cost (co-ordination and cooperation costs) will increase but the amount of extra costs will be limited.

Cooperation between vertically integrated TSOs may lead to competition concerns. Therefore it is very important that cooperation happens between TSOs that are properly unbundled.

The main benefits of TSO cooperation for the integration of the European market are:

- (1) The development of market and technical codes;
- (2) Coordination of grid operation
- (3) Investment planning

Concerning the first point, TSO cooperation will enhance the market integration as the companies' costs of entering new markets will be greatly reduced. For example, differences in procedures make booking of network capacity in different countries very difficult for companies.

Concerning the operation of the grid, the main improvement is in security of supply, especially in electricity, where cooperation in grid operation is indispensable. For gas the benefits are less in improved security of supply, although they are present in effectively dealing with unexpected outages of pipelines for example. For both electricity and gas, coordination of grid operation will also enhance optimising the use of the network, in particular on the interconnectors.

Security of supply and competition can only be enhanced if the adequate infrastructure is in place that allows gas and electricity to flow freely throughout Europe. All over the EU demand rises, consumption patterns change and import dependence for primary fuels increases, therefore large investments in infrastructure are required. A great benefit of cooperation will be greater transparency and visibility of network development issues allowing investments to be made where they are most effective. The other obvious benefit is coordinated adequate investments will enhance competition and ensure supply security.

The three main reasons calling for a strong cooperation between TSOs in research and innovation are:

1. Several problems of cross-border nature can be solved only if several TSOs are actively collaborating to find and implement joint solutions.
2. Many other problems are common to all European TSOs. Therefore, strong cooperation has a large potential for significant economy of scale.
3. The interoperability of control and monitoring equipment is a precondition to the effective integration of national system. Trans-national cooperation of network operators will facilitate the emergence of agreed standards and compatible operational procedures/equipment.

There is an additional important argument in favour of reinforced cooperation. TSOs are encountering severe difficulties in recruiting qualified technical staff. Wages are only part of the problem. Young qualified engineers are attracted by positions which include an international dimension in their day to day work. By restructuring network industries, this reinforced cooperation will probably increase the number of jobs in the sector. The cost for the EU budget of further TSO cooperation will be limited to the coordination role of the planned agency (equivalent to a few full-time staff members), whereas ETSO+/GTE+ would be financed by the industry at a modest cost. It is estimated that ETSO+ and GTE+ would need about 100 staff to operate, part of which would be found by shifting tasks from national TSOs. The net cost of setting up these two bodies (about 8 million euros per year) is small in comparison with the size of the industry and will likely be offset by efficiency gains in network management at EU level. Stronger cooperation could reinforce this international dimension to the TSO business.

## 5.5. Increased transparency for wholesale markets

No EU action

Current requirements on transparency focus on publication of capacity of the network, so that market parties are able to see if capacity is available and if all available capacity is offered to the market.

Option

Increasing transparency so that market parties will have equal access to information that lies at the basis of price movements, will greatly increase the efficiency of the supply chain. By providing more transparency on supply and demand, suppliers will be able to rely on wholesale markets to determine the price for their customers and to decide on investments in for example power plants. Reliable pricing will lead to liquid markets where suppliers can hedge their risks and optimise their supply portfolio. This will increase efficiency that will lead to lower costs.

As trading in commodities is currently not covered by other legal instruments like the Markets in Financial Derivatives Directive, it needs to be ensured that any transparency requirements on trading are consistent with the more general regulation for financial markets.

More transparency will also mean improvement of economic optimisation of the available fuel sources that take into account the costs of emissions. In particular, the functioning of the market for emission certificates is to some extent dependent on a functioning trading market for gas and electricity. Consider a company which contemplates whether or not to invest into an energy and emission saving production technology. Only if this company has reliable information on the future price of emissions and electricity or gas can it make a reasoned investment decision and can it actually hedge its risk by buying the relevant derivatives. If there is for example no reliable forward curve for the electricity price it becomes significantly less interesting for the company to deal with emission certificates since there is a certain trade-off between emissions and electricity consumption. More generally, a functioning financial market for gas and electricity derivatives will ensure that emissions reduction happens in the most cost-efficient way.

The additional regulatory costs of more transparency could result from the increased need for resources (human, financial) to monitor compliance of transparency requirements. Besides, additional costs for the regulator may be incurred due to the publication (e.g. on internet) of certain market information.

The costs of compliance with additional transparency legislation is hard to assess, as they depend very much on the detailed requirements. The opinion held by stakeholders is that transparency on physical assets (network operation, generators, storage facilities) has a low cost compared to the benefits for the market. Concerning transparency in trading, the outcome is less clear and needs more investigation. . The largest private costs of compliance, which should be passed onto the consumer through more transparency, are incurred by firms who previously benefited from a strategic advantage due to information asymmetry.

## **5.6. Actions to regulate long-term contracts in gas**

No EU action

The current legislation contains the possibility to exempt major new infrastructure from regulated third party access rules, for a pre-determined period. This possibility has already been used several times, for both new gas and electricity interconnectors and LNG facilities. This helped take forward projects which benefit both security of supply and competition.

Option

Policy actions with regard to long term contracts mainly impact the level of competition in the gas market. A higher level of competition induces higher operational and allocative efficiency and results in lower prices for the gas and transmission capacity rights. This implies a shift of welfare from current gas suppliers and gas transporters to final consumers. All end customers are likely to benefit but the degree to which end-consumers benefit from the price decrease depends on the type of customer.

The likelihood of above described economic impact is high, as it will mean an increase in efficient use of the transport system.. The cost of regulation and the cost of compliance are expected to be less than economic benefits.

If the matter would touch on the financial parameters of existing contracts, it can have a negative impact on investment. An example of such could be the reduction in applicability and scope of existing long-term contracts, thereby changing the financial position of TSOs. However, new investments would not be affected as such if the legal framework does not change.

## **5.7. Access to gas storage and LNG facilities**

No EU action

The Directive on the internal gas market defines when, and if so, how, storage operators have to give access to third parties. The requirements in the Directive are limited to the principles, but body was given to these principles through the Madrid Forum, where all stakeholders agreed to voluntary 'Guidelines for Good Third Party Access Practice for Storage System Operators' (GGPSSO). ERGEG has followed the implementation of these guidelines and has concluded in its last monitoring report, that was presented to the Madrid Forum participants in November, that overall implementation of these guidelines is poor.

Option

Implementing legal and functional unbundling for gas storage facilities and developing corresponding binding guidelines are considered to be favourable in terms of costs and benefits. As storage forms an important part of the supply chain for gas, and often is a necessity where no other options for flexibility are available, access to storage will enhance the possibilities for new entrants. This will stimulate competition in gas supply, but it will also enhance, where possible, optimisation of storage among other flexibility tools.

It is important that access rules do not interfere with the investment climate. Therefore storage regulation should not be oversimplified but recognise the different roles storage can play, as the current regulatory model does. Regarding the longer term impact, increased powers of



regulators should not have an adverse effect on the investment climate and on the level of investment in the gas storage market as long as these powers focus on ensuring effective control over the way in which rules for third party access and unbundling are met by the storage system operators.

LNG is becoming an ever-more important source of gas to the EU. New LNG-terminals can be exempted from third party access, but this exemption is always temporary. Exemptions are often conditional and a common reference is needed for access rules. In the course of the Impact Assessment it was concluded that requirements to improve access to storage also need to be extended to LNG-terminals.

## **5.8. Strategic gas stocks**

### No EU action

EU legislation addresses gas security of supply with two instruments. First, Directive 2003/55/EC introduced general monitoring obligations for the Member States. Second, a Directive 2004/67/EC specifically concerns measures to safeguard security of gas supply. This later directive establishes the Gas Coordination Group and defines a "Community mechanism" in case of supply disruption.

These instruments provide for a coordination platform. They do not define quantitative objectives as regards security of supply nor provide any obligation as regards gas stocks. Finally, they do not foresee any binding solidarity agreement, nor do they establish a framework for such agreements.

### Option

Imposing a gas storage obligation upon gas supply undertakings greatly enhances the overall security of supply of the European gas supply system, with the costs of the policy action being incurred by final consumers. In addition, some reservations need to be made regarding (i) the impact on current security of supply arrangements, (ii) cost pass-through, (iii) market distortion. Imposing such obligations influences current market arrangements with regard to security of supply (own storage operations, interruptible contracts, etc.). Where gas suppliers currently meet security of supply concerns with a variety of instruments that minimised their total costs, the obligation could stimulate gas suppliers to move away from this optimal portfolio towards a possibly higher cost alternative: gas storage. In other words, this policy measure can have a negative impact on overall system efficiency.

The physical opportunities for gas storage vary largely across member states and therefore the costs of the obligation can potentially differ widely across member states. These differences can create an uneven playing field for gas supply companies on the European market. Implementation of this policy action will in particular affect the storage market, and can affect the availability of storage capacity to the market.

To deal with these concerns, the following elements must be taken into account when implementing the proposed policy measure: Market arrangements on security of supply concluded after policy implementation should be additional to existing measures, and not replace them. When an efficient performance of the overall energy sector is taken as reference, the main question should be: which security of supply arrangements needed for a given security of supply level are the cheapest? Storage is probably not the least cost option in

all countries and regions. In this sense, the policy action can lead to non-optimal outcomes. In order to increase efficiency, a more market based policy measure might be better suitable.

Given the complexity of the subject, the Commission intends to launch a study on strategic gas stocks in the coming months.

### **5.9. Changes to the framework for investments in major electricity and gas infrastructure**

No EU action

Under current legislation, some new infrastructures are operated under regulated TPA and some new infrastructure operated under an exemption from regulated TPA. The exempted projects tend to have higher risk profiles making them more costly. Higher investments in gas network capacity will increase potential competition on wholesale markets, since it increases interconnection with neighbouring markets. This effect is supported by theory (Cremer and Laffont 2002).

Option

Costs of exempting infrastructure is that a part of a network will be optimised individually, instead of taking into account the whole network. A benefit is the fact that no cost-socialisation will take place, meaning that consumers will not run the risk of having to pay for inefficient investment in infrastructure. These costs and benefits however already exist in the current regime and will not change.

The baseline scenario would lead to increasing national differences in the application of the exemption requests for new infrastructure projects. Some Member States may become excessively generous to grant exemptions and thus risk a partial foreclosure of the gas market and a strong discrimination between assets with third party access and exempted ones. Specifying and clarifying the legislative framework for these exemptions through specific guidelines would reduce this risk and would be favourable for the treatment of cross-border exemption requests. To achieve a more homogeneous approach it is moreover advisable to attribute to the new Agency for the Coordination of Energy Regulators the task of granting exemption requests for pipelines crossing more than one Member State.

The proposed changes to the legislation will give clearer indications to the market under which conditions projects are eligible for exemptions. As more clarity is provided this will relieve companies and governments of a part of their administrative burden.

### **5.10. DSO unbundling**

The Commission services considered reinforcing the unbundling obligations for DSOs and to apply the obligation of legal and functional unbundling also to all DSOs serving less than 100 000 connected customers. As with TSOs, the more effective unbundling of DSOs would in principle contribute to the creation of a level playing field at the retail level, mainly by eliminating the incumbents' information advantages, preventing cross-subsidies and ensuring fair network access and transparent customer switching procedures. . This measure would thus contribute to the contestability of the retail market and thus facilitate market entry by third party suppliers.

The Commission has considered the following arguments in favour and against further unbundling of DSOs:

*Arguments in favour of further unbundling of DSOs*

Firstly, vertically integrated DSOs have an interest to make switching procedures more difficult to deter market entry. In particular, they may not have an interest to introduce smart metering which makes retail markets more transparent and customer switching easier. Using the same established brand name for the supply and the network business may also give them a comparative advantage over new entrants. Secondly, as at TSO level, incumbents may benefit from privileged access to network information. This issue may in fact be even more important at distribution level as regards metering: privileged and priority access to consumption information for the integrated network company can be a strong advantage. Thirdly, as at TSO level, there is a risk that the supply business of a DSO benefits from cross-subsidies of the network business of the integrated company. Fourthly, the ownership of the network assets may be seen to put vertically integrated DSOs at a competitive advantage due to their easier access to capital compared to companies without these assets.

*Arguments against further unbundling of DSOs*

On the other hand the issue of discrimination for network access appears to be less relevant at DSO level than at TSO level as there is no congestion at distribution level so that access is in principle available to all. Moreover, DSOs are not involved in balancing rules so discrimination is not possible in this regard. Secondly, at distribution level, the needs of customers determine investments, not the needs of suppliers, importers or generators as for transmission. An exception are very small generation sites directly connected to the distribution network ("distribution generation"), this concerns mainly renewables and is marginal now but may become more significant in the future. Thirdly, DSO unbundling is less relevant with respect to EU cross-border flows as these flows are essentially local. In contrast, an integrated wholesale EU market in terms of cross-border flows is about stronger interconnectors capacities and harmonised procedures at transmission level. Fourthly, there is insufficient legislative experience with respect to the present unbundling obligations on DSOs. Functional unbundling as introduced in 2004 cannot be fully effective without legal unbundling. However, legal unbundling has been imposed on DSOs only as of 1 July 2007. Fifthly, full ownership unbundling of DSOs in parallel to TSOs unbundling may be difficult to implement. As ownership unbundling of TSOs is likely to require the restructuring of several large vertically integrated companies including the possible divestiture of certain subsidiaries and assets, a similar restructuring process at DSO level may overstretch the ability of financial markets to cope with the financial consequences. This is particularly true because there are several hundred DSOs in the EU and for some of the vertically integrated companies the value of the assets of the distribution network is far more important than the value of the transmission network.

In the case of smaller DSOs (serving less than 100 000 customers) several Member States have transposed the exemption from legal and functional into their national law, for example, Germany and France. This threshold takes into account that small DSOs with relatively few employees are likely to suffer over-proportionately from a loss of synergies if the network operation is entirely separated from the other business activities. These considerations still appear to be valid. However, as with DSOs above the threshold it appears possible and desirable to reinforce the powers of national regulators to monitor the existing unbundling requirements. Some of the benefits of further unbundling such as easier switching procedures

and the prevention of brand confusion may in fact also be achievable by developing binding guidelines and specifying certain provisions in the legislative texts. Reinforced powers of national regulators may help to counter the problem of cross-subsidies and of information flows within vertically integrated DSOs.

### **5.11. Other measures to enhance retail competition**

As explained above, the enhancement of retail competition can be achieved by other measures than DSO unbundling.

A clear definition of roles and responsibilities of all market participants, that is transparent to new entrants, will have low costs, as these things need to be in place anyway in order to establish household competition. Costs of making the rules transparent are low, and costs of improving the rules will be easily offset by increased competition.

Smart metering will help to reduce energy consumption, increase transparency and thereby increase switching rates and competition. Immediate demand response would also increase efficiency and security of supply.

A smart meter records how much electricity, gas or water an individual customer uses and when it is used (typically hourly). Via a network this information is sent to the local utility for monitoring and billing purposes, making it possible to charge different prices for consumption based on the time of day and the season. Higher electricity prices during peak demand periods will give consumers an incentive to reduce their demand, or shift their use to periods of lower demand (e.g. weekends or later in the evening) and away from times of the day when electricity (gas, water) is most expensive. In contrast, conventional meters measure only how much energy is consumed by a customer each billing period (typically one or two months).

There are a few countries that have installed smart meters and the experienced costs and benefits are presented below. Smart metering has been introduced on a larger scale in Italy and Canada (Ontario), Australia (Victoria) and Sweden. A number of further countries have already carried out pilot studies and some of them plan to introduce smart metering country- (state-) wide over the next years (UK, Ireland, the Netherlands, France, Canada (Alberta) and the USA (California, Texas, Idaho, Washington DC)).<sup>19</sup>

#### **Italy**

The Italian utility ENEL introduced smart meters already in 2001 in their "Telegestore project". Mass installation started in January 2002 and since then almost 30 million smart meters have been installed in Italy. Enel has invested around €2.1 billion in this project, which is an equivalent of around €70 per customer. Annual savings per customer were projected with €500 per annum for the period after full installation, which has almost been achieved in 2006.

#### **Sweden**

First pilot studies were already carried out in Sweden in 2001. In 2003 a law was passed that requires smart meters to be installed for all customers by 2009 (monthly metering). Typical

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<sup>19</sup> For a general overview on the costs and benefits of smart metering see the paper by Capgemini consulting: [http://www.us.capgemini.com/DownloadLibrary/files/factsheets/Capgemini\\_SmartMetering\\_FS.pdf](http://www.us.capgemini.com/DownloadLibrary/files/factsheets/Capgemini_SmartMetering_FS.pdf)

costs per connection point are around €200-€220 and will be passed through to the customer. It has been estimated that the net cost of smart meters (discounting positive effects) would be about 10 to 15 euros per year for each connected customer.

### **Pilot studies**

California will install smart meters to the 9 million gas and electric household customers in the Northern California territory of PG&E. All advanced meters and the necessary communications infrastructure shall be fully installed by 2012 or 2013. In the Netherlands pilot projects are being carried out. Legislation on a country wide introduction of smart metering is currently discussed.<sup>20</sup> In the UK a number of pilot studies have been carried out, a country-wide obligatory roll out is still being discussed. Assuming cost-recovery over a 15-year period (life of asset) Owen and Ward (2006) estimated the extra costs per customer per year to be around £8 for the meter, plus £5-10 for operation and maintenance (all nominal values)<sup>21</sup>. Estimates made by Ofgem assume costs of €44 to €18 per meter (This includes the cost of the meter, installation, (potential) stranding cost and the systems costs necessary to retrieve and process the data from the meters.)<sup>22</sup> For a trial of 520 SME sites using smart metering, the UK Carbon Trust reports an average saving of carbon of 5-6%.<sup>23</sup>

### **5.12. Further measures related to consumer protection**

The obligation to provide information regarding (i) comparable price information, (ii) switching procedures and (iii) protection against unfair selling practices, will -at least potentially- contribute to the consumer protection, the contestability of the market and the energy prices. It will increase the availability of information and therefore strengthen the consumer's position on the market. Beside that, we expect that the costs pertaining to this obligation are rather low for both public and private sector. However, one should consider that the (daily) use of Internet is not yet common for all Member States-citizens, especially those who are in a vulnerable position. Further, we observed that in several Member States comparable prices are already available, sometimes provided by commercial parties.

Finally, the introduction of compulsory rules to protect vulnerable customers would increase consumer protection. It depends on the legislative detail (who is paying?) whether the private sector compliance costs or the public sector spending will increase. National existing social legislation already partially protects these customers.

### **5.13. Analysis of macroeconomic impacts**

The rationale behind the liberalisation of network industries is to improve their sectoral performance and thereby to generate wider-reaching macro-economic benefits. A defining structural characteristic of most network industries is the presence of bottlenecks separating producers and customers, notably the grid itself – e.g. transmission lines, pipes, railway tracks. These industries are also exceptional in that they provide essential inputs for virtually

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<sup>20</sup> <http://www.beama.org.uk/hottopics/Smart+Metering/default.asp>

Details on the estimated costs and benefits of the introduction of smart metering in the Netherlands can be found in a study by SenterNovem / KEMA consulting (2005): [http://mail.mtprog.com/CD\\_Layout/Day\\_2\\_22.06.06/0900-1045/ID57\\_Siderius\\_final.pdf](http://mail.mtprog.com/CD_Layout/Day_2_22.06.06/0900-1045/ID57_Siderius_final.pdf)

<sup>21</sup> <http://www.sustainabilityfirst.org.uk/publications/smartmeters.php>

<sup>22</sup> <http://www.ofgem.gov.uk/Markets/RetMkts/Metrng/Smart/Documents1/12813-2006.pdf>

<sup>23</sup> <http://www.carbontrust.co.uk/publications/publicationdetail.htm?productid=CTC713>

the entire economy. The importance of the proper functioning of these industries is further reinforced by their role as providers of services of general economic interest.

Most network industries were traditionally organised as vertically integrated state-owned monopolies. Therefore, the separation (unbundling) of the bottleneck segments, which generally have inherent natural monopoly features, from the potentially competitive segments (such as production, supply and maintenance) is a cornerstone of the market opening process. The resulting increase in competitive pressure should entail higher productivity (and productivity growth) and a downward pressure on prices, ultimately translating into higher economic growth.

To assess the macro-economic impact of liberalisation, one has to distinguish between direct effects on the network industries, effects on customers and indirect economy-wide effects. Some direct effects on the industries themselves are likely to be negative as the competitive pressure and the drive for more efficient production are likely to exert downward pressure on employment levels and mark-ups in incumbent firms. Nonetheless, lower prices and product innovation ensuing from the competitive pressures may lead to higher demand and output and thus mitigate the adverse employment effects. Although the effects of liberalisation on customers are expected to be positive and much larger than the effects on the incumbent firms and their employees, they are by and large more dispersed and less tractable. Indeed, lower prices of network industry services would enhance welfare by raising real household incomes and lowering the costs for those industries which rely heavily on inputs from network industries. Furthermore, given the considerable weight of network industries in the Harmonised Index for Consumer Prices, price developments in network industries may also have important consequences for the efficient conduct of monetary policy. In contrast to the direct effects on firms and employees in the sector, the indirect effects are far less visible and thus hard to measure and quantify. Moreover, in terms of timing, one can expect the incumbent firms and their employees to feel the effects of liberalisation rather abruptly while customers reap benefits somewhat later. The indirect effects would normally take much longer to materialise.

If one intends to quantify the effects of a further liberalisation of the energy (electricity and gas) sector one should be aware of significant data, statistical and model uncertainty. Accordingly, the results of such a quantification should be considered only as indicative of the potential benefits of these regulatory reforms.

#### *Simulations based on QUEST model*

The Commission services have undertaken two such simulations. The starting point of the first simulation is the ECB estimate for EU 15 that further regulatory reforms in the EU electricity sector could lead to price reductions of about 20%. This result is based on the assumption that all EU 15 Member States align their regulatory conditions to those of the 'best practice' country and that prices adjust accordingly. Given the share of the EU electricity industry in value added (1.9%) and the size of the non tradable sector (2/3 of value added), a price reduction of 20% would be associated with a price decline of 0.6% in the non tradable sector. This reduction in prices has been translated either into a total factor productivity (TFP) or into a mark-up shock in the European Commission QUEST model. The shocks associated to the 20% price fall in the electricity sector were thus assumed to correspond to a TFP increase of 25% or to a decline in mark ups by 15 percentage points. In reality the reforms are likely to affect both mark-ups and efficiency and therefore, the observed price decline is the result of a combination of a mark-up reduction and of efficiency gains. The shocks to TFP and

to mark ups are calibrated in such a way that the full price decline is spread over a period of five years.

The results for electricity on the real GDP are presented in the table below. The respective effects of a TFP and a mark-up shock are different. The results for electricity market liberalisation on the real GDP are presented in Table xx. The respective effects of a TFP and a mark-up shock are different. Over a period of five years, the GDP effect generated with the two channels is quite similar and amounts to about 0.5% to 0.6% of GDP. In the longer run, however, the effect from a reduction in mark ups seems somewhat stronger. Though the total GDP effect is similar, both channels have different effects on employment. With the efficiency (TFP) channel, the reform is associated with an increase in investment in the non tradable sector but a decline in employment and a shift of employment to the tradable sector. The net employment effect is slightly negative. With the mark up channel, the investment and employment effects are stronger. In the first case more output is produced with a more efficient use of resources while in the second case, increased competition shifts the demand for factors of production in an upward direction. A similar analysis for the gas would lead to effects equal to roughly 30% of those observed for electricity.

#### Macroeconomic effects of an increase in total factor productivity in the electricity sector

|                       | Increase of TFP by 25% |            |           | Increase of TFP by 10% |            |           |
|-----------------------|------------------------|------------|-----------|------------------------|------------|-----------|
|                       | GDP                    | employment | inflation | GDP                    | employment | inflation |
| <b>After 1 year</b>   | 0,02                   | -0,1       | -0,05     | 0,01                   | -0,04      | -0,02     |
| <b>After 5 years</b>  | 0,51                   | -0,01      | -0,39     | 0,2                    | 0          | -0,16     |
| <b>After 10 years</b> | 0,51                   | -0,05      | -0,37     | 0,2                    | -0,02      | -0,15     |

Note: figures are % deviation from the base year. Investment refers to the non-tradable sector.

Source: Quest-model, run with adapted ECB estimates.

The second simulation is based on a study undertaken by Copenhagen economics that aims at fine-tuning the estimation of the effects of ownership unbundling on electricity prices by first deriving Market Opening Milestones (MOM).

## Market Opening Milestones

The OECD has calculated an indicator to track regulatory conditions in seven network industries. This indicator is based on different industry characteristics including entry regulation, public ownership, market structure, vertical integration and price controls. It shows a relatively high level of regulation in France, Greece and Ireland and lower levels in Germany, the Netherlands. While in 2003 network industries in the euro area were still more heavily regulated than in the US (except for electricity), the process of deregulation (over the period 2000-2003) was more rapid in the EU, especially in electricity and postal services.

A study carried out by Copenhagen Economics in 2007 on the impact of market opening in network industries traces the evolution of market opening by defining a set of "Market Opening Milestones" (MOM) for each sector. This economic assessment also concentrates on the question of the ownership unbundling of transmission networks:

- fully integrated TSO (0 points)
- accounting separation (0.15 + 0.10 additional score for published accounts, compliance officer, separate corporate identity and location)
- management separation (0.40 + 0.10 additional score for published accounts, compliance officer, separate corporate identity and location)
- legal separation (0.65 + 0.10 additional score for published accounts, compliance officer, separate corporate identity and location)
- ownership separation (0.90 + 0.10 additional score for published accounts, compliance officer, separate corporate identity and location).

For each country, sector and year, the MOM scores are weighted and summed to create a Market Opening Index (MOI). Regressions were carried out to test the connection between MOM and MOI, on one hand, and indicators of performance on the other hand. In the case of electricity prices, Copenhagen Economics found a statistically significant relationship with the MOM representing the degree of unbundling of TSOs.

The Commission services performed simulations of the effect on electricity prices of bringing 25 Member States (excluding Cyprus and Malta) up to a score of 1 in respect of TSO unbundling. They assumed that the results derived by Copenhagen Economics for EU15 in the period 1990-2001 are still valid for these 25 Member States from 2007 onwards. The Commission services then calculated averages using the 2007 electricity prices from the structural indicators, weighted by each country's share of inland market consumption.

The calculations performed by the Commission services on the basis of the Copenhagen Economics study provide some positive results. The initial price change due to ownership unbundling of transmission would be about -1.2%. After 10 years, the impact on prices would be a reduction of about 8%. The simulation models the effects of moving from management separation or legal separation to full ownership unbundling. It does not allow comparisons between ownership unbundling and the ISO solution.

The results for electricity market liberalisation on the real GDP are presented in the next table. Once again, the respective effects of a TFP and a mark-up shock are different. Over a period of five years, the GDP effect generated with the two channels is quite similar and amounts to about 0.2% of GDP. In the longer run, however, the effect from a reduction in mark ups seems somewhat stronger. A similar analysis for the gas would lead to effects equal to roughly 30% of those observed for electricity.



## Macroeconomic effects of a mark-up reduction in the electricity sector

|                       | Reduction of mark-up by 15% points |            |           | Reduction of mark-up by 6% points |            |           |
|-----------------------|------------------------------------|------------|-----------|-----------------------------------|------------|-----------|
|                       | GDP                                | employment | inflation | GDP                               | employment | inflation |
| <b>After 1 year</b>   | 0,03                               | 0,03       | -0,06     | 0,01                              | 0,01       | -0,02     |
| <b>After 5 years</b>  | 0,57                               | 0,49       | -0,41     | 0,23                              | 0,2        | -0,16     |
| <b>After 10 years</b> | 0,62                               | 0,42       | -0,45     | 0,25                              | 0,17       | -0,18     |

Note: figures are % deviation from the base year. Investment refers to the non-tradable sector.

Source: Quest-model, run with adapted Copenhagen Economics estimates.

Not surprisingly, the simulation results based on Copenhagen Economics give lower positive impacts than those based on ECB estimations, as the expected downward effect on prices is expected to be smaller. Thus, while the simulations based on the ECB estimations should illustrate the upper-end estimations of macroeconomic effects of a further energy-market liberalisation, the simulations based on Copenhagen Economics should be interpreted as the more central or conservative estimations.

In both simulations, the driving force behind the positive growth effect is the boost in investment and innovation triggered by the change in relative prices, namely in the non-trading part of the economy. As it has also been assumed that the expected reductions in wholesale prices will be passed through to end users, consumer prices will also be affected. Given the high share electricity and gas consumption have in the consumer price basket, consumer prices are estimated to be about 0.2 to 0.4% below the baseline level after two to three years.

### *Simulation based on WorldScan model*

Regulatory reforms in the EU energy (electricity and gas) sector have not only direct impacts on energy consumption, production and trade. A further liberalisation of the energy markets has also indirect impacts on other sectors in the EU economies which arise from increased productivity driven by competition in the energy sector and lower energy prices. Moreover, these changes in relative prices and comparative advantage lead to structural changes on a sectoral level within the Member States and internationally.

For the quantification of the macroeconomic impacts of energy market liberalisation, the Commission has also used WorldScan, a global (recursive) dynamic computable general equilibrium (CGE) model with multiple regions, sectors, and production factors as well as imperfect competition that focuses on the economies of the European Union.<sup>24</sup> Computable general equilibrium models provide a comprehensive and consistent framework for studying price-dependent interactions between the energy system and the rest of the economy. They consider indirect spillovers to other markets which in turn feed back to the economy and hence allow the quantitative analysis of direct and indirect impacts of policy interference.

<sup>24</sup> WorldScan has been developed at The CPB Netherlands Bureau for Economic Policy Analysis ([www.cpb.nl](http://www.cpb.nl)). See Lejour et al. (2006)

Liberalisation leads to an increase in total factor productivity (TFP) in the electricity and gas sector in the EU Member States. However, the progress of energy sector deregulation varies considerably between Member States and even between different energy sectors. The productivity gains that can be expected from liberalisation therefore differ in magnitude (see Kent and Simon, 2007; Nicoletti and Scarpetta, 2003): Economies that have so far implemented only limited reforms in the energy sector are expected to achieve higher productivity gains from full deregulation than economies that are relatively advanced in their energy market reforms. The following scenarios have been analysed in order to assess the impact of further regulatory reforms in electricity and gas markets in EU Member States:

[LIB] Liberalisation has a differentiated impact on TFP growth depending on the current level of energy market regulation in the different Member States. Furthermore, the liberalisation benefits differ between electricity and gas markets.

[LIB+] In addition to the TFP growth in the previous scenario, we assume that the deregulation leads also to an increase in intra-industry trade flows across member states in the energy sector. This effect is modelled through a 50 percent increase of the so-called Armington elasticity that governs substitution possibilities between domestically produced and imported goods.

Estimates for potential efficiency gains from regulatory reforms in the electricity and, especially, the gas market are difficult to obtain. For simulations with WorldScan, the OECD International Regulation Database which provides internationally comparable cross-country differences and changes in the regulation of non-manufacturing sectors (Conway and Nicoletti, 2006) is used. The OECD measure of product market regulation for the energy sector (electricity and gas, respectively) covers information on entry regulation, public ownership, vertical integration and market structure. The index ranges from most restrictive (6) to least restrictive (0) and is available for the period 1973 to 2003. The indicators of regulatory conditions in the electricity sector and the gas sector in different OECD countries in 2003 are provided in the Appendix A.<sup>25</sup>

A broad range of TFP impacts (and associated energy price reductions) is allowed for, in line with other international studies (see, e.g., Fairhead et al., 2002). TFP improvements are assumed to range between 10 percent for economies in the OECD database that have already implemented many reforms across the market segments to 30 percent for economies that have introduced only limited reforms in the electricity sector and from 5 percent to 20 percent in the gas sector as reforms in the gas sector are not as extensive. The resulting TFP increases for the Member States that are implemented in scenario [LIB] vary between about 11 percent (the Netherlands, UK) and about 23 percent (France, Greece, Ireland, Poland) in the electricity sector and between about 9 percent (Germany, UK) and 19 percent (Finland, Greece, Poland) in the gas sector.<sup>26</sup>

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<sup>25</sup> For the missing values for the gas sector (Slovenia and other not listed EU-12 MS) we assume the average of the existing EU-12 country information (i.e. the values for Czech Republic, Hungary, Poland, and Slovakia). In order to obtain the missing values for the electricity sector (EU-12 MS) we assume the same absolute difference in regulatory conditions between the two sectors as for the old MS.

<sup>26</sup> Since the energy sector in WorldScan comprises coal, natural gas, gas distribution, refined oil products and electricity, the TFP shock is implemented in proportion to the electricity and gas share in total energy sector.

The WorldScan simulation results for the different scenarios are summarised in the below table. In both policy counterfactuals, TFP is increased in the electricity and gas sector gradually between 2007 and 2010. The impacts of the liberalisation scenario [LIB] are reinforced with increased cross-industry trade in scenario [LIB+]. In the scenario [LIB], efficiency improvements in the electricity and gas sectors lead to lower energy prices which in turn impact the rest of the economy. In 2010, energy prices decrease by 5.3 percent (5.5 percent in scenario LIB+) compared to the baseline. Not surprisingly, the decrease in electricity prices together with higher national incomes due to the spill-over of productivity gains to the rest of the economy triggers an increase in energy demand and energy production (10.4 percent in scenario LIB, 14.6 percent in scenario LIB+). As a result, CO<sub>2</sub> emissions increase by a similar order of magnitude all other things equal. The economy wide benefits, especially in the energy intensive industries, result in a higher EU25 gross domestic product of 0.9 percent (1.0 percent in LIB+). These economy wide impacts of energy price reductions are enhanced through the reallocation of productive resources in all economic sectors triggered by the reduction in energy prices and comparative advantages.

The GDP impacts vary between Member States according to their current level of regulation. The increase in output exerts an upward pressure on prices for labour and capital. The sectoral implications of energy market liberalisation depend on the factor intensities in the different sectors: prices in energy intensive industries (medium-low tech. manufacturing and medium-high tech. manufacturing) are reduced while labour- and capital-intensive sectors like high tech. manufactures and commercial services even face higher production costs and prices.<sup>27</sup> The changes in relative prices also reflect the adjustments in domestic final demand and international competitiveness. While the overall export volume and the sectoral shares in world production for energy intensive industries increase, these shares are reduced for labour- and capital-intensive sectors. Only the service sectors that are less exposed to international competition univocally benefit from higher economic activity despite their relatively high labour intensity.

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<sup>27</sup> The reduction of transport prices can be explained by the sectoral aggregation of WorldScan: refined oil products which are mainly demanded in the transportation sector are also part of WorldScan's energy sector.

WorldScan simulation results for EU25 in 2010 for different scenarios

|  | <b>LIB</b> | <b>LIB+</b> |
|--|------------|-------------|
| <i>Gross dom. product</i> (% change vs baseline)                               | 0.9        | 1.0         |
| <i>Export volume</i> (% change vs baseline)                                    | 0.9        | 0.8         |
| <i>Sectoral price</i> (relative to regional producer price in % change vs BaU) |            |             |
| agriculture, oil, minerals   | 0.1        | 0.2         |
| energy   | -5.3       | -5.5        |
| Low tech. manufactures   | 0.1        | 0.1         |
| medium-low tech. manufact.   | -0.3       | -0.4        |
| medium-high tech. manufact.  | -0.1       | -0.1        |
| high tech. manufactures  | 0.2        | 0.2         |
| Transport  | -1.2       | -1.5        |
| commercial services  | 0.4        | 0.4         |
| government and other services  | 0.6        | 0.6         |
| <i>Energy production</i> (% change vs baseline)                                | 10.4       | 14.6        |
| <i>Sectoral shares in world production</i> (absolute change vs baseline)       |            |             |
| agriculture, oil, minerals   | 0.2        | 0.2         |
| energy   | 0.9        | 1.6         |
| low tech. manufactures   | 0.0        | 0.0         |
| medium-low tech. manufact.   | 0.1        | 0.1         |
| medium-high tech. manufact.  | 0.1        | 0.1         |
| high tech. manufactures  | -0.2       | -0.3        |
| transport  | 0.3        | 0.4         |
| commercial services  | 0.1        | 0.1         |
| government and other services  | 0.2        | 0.2         |

Source: Own calculations using WorldScan.

#### 5.14. Analysis of employment and social effects

The impacts on employment of the opening of gas and electricity market have already been subject to a study commissioned by the Employment Directorate General of the Commission on the "Employment Effects of the Opening of Gas & Electricity Markets". The direct social impact in form of declining employment in the energy sector of all proposed measures is likely to be very limited. Most companies of the sector are already in the process of restructuring to cope with liberalisation irrespective of the introduction of further unbundling and improved regulation. Indirect effects, linked to a well functioning internal EU energy market, are potentially rather positive. The effects of ownership unbundling on employment have been studied together with other macro-economic impacts in the chapter above. It is clear that unbundling would, in the worst case scenario, have a virtually neutral effect on employment and, in the best case, a positive effect.

The possible social dimension will concern mainly the public vertically owned companies in case where the ownership unbundling would lead to a privatisation of the network assets. One could argue that the ownership unbundling or ISO model will reduce the mobility of workers within the vertically integrated company. However, this is already the case due to legal and functional unbundling, which include a compliance programme and "Chinese walls". In those countries where ownership unbundling has been implemented, there have been no significant lay-offs by formerly integrated companies. There is no reason to believe either that, due to ownership unbundling, some countries or regions may be more affected than others. The ongoing liberalisation process, irrelevant of the status of the ownership of transmission networks, led to efficiency improvements and productivity gains, which will continue.

Regarding the protection on the workers, there is a possibility that networks assets which are quite attractive for the investments funds can be taken over by private funds, which may give priority to short term profitability over long term investments. This would however be in complete contradiction of such funds, which usually acquire these assets because of their long term regulated profits outlook.

Different protective mechanisms are already in place in the EU and national law both in the internal market directives and second in the labour law regarding corporate restructuring:

The first one concerns the designation of the TSO by national authorities and the duration of this designation. In defining the conditions of TSO licensing and the duration of the licence, national authorities can decide which company is going to buy the network and for how long this company will be the TSO. TSOs are usually designated for a long period, such as 20 years. One may expect pressure from investment funds to reduce this duration but this will be a matter of negotiating between the government and possible buyers.

The second barrier is linked to regulator's powers. The Commission is fully aware of the temptation to invest in a profitable asset and to take the revenues without doing the right investments in the networks. Due to the experience in some MS as clearly demonstrated in the sector enquiry, the Commission will propose to reinforce the powers of the national regulators on this aspect. This measure will have a positive impact on the workforce.

As regards corporate restructuring, the provisions of several labour law Directives can have a direct impact, in particular though the procedures they provide for the involvement of workers' representatives in the restructuring process. The Directives can play a crucial role in smoothing the possible adjustment process at company and group level in that they seek to

promote an approach aimed at anticipating change and encouraging co-operation in responding to it.

These directives, like all directives, are binding on the Member States as regards the objective to be achieved, but Member States are free to determine the form and methods used to fulfil Community obligations under their internal legal order. In addition, in the area to which the directives apply, national legislation and practice may provide for a level of protection of workers superior to the ones provided by these directives.

#### **At National level:**

-The Directive establishing a **general framework for informing and consulting employees** in the European Community<sup>28</sup> seeks to strengthen dialogue within enterprises and ensure employee involvement upstream of decision making with a view to better anticipation of problems and the prevention of crises. It applies to undertakings with at least 50 employees or establishments with at least 20 and provides that employee representatives be informed and consulted on developments in the undertakings economic situation, development of employment and decisions likely to lead to changes in work organisation or contractual relations.

-The Directive relating to the safeguarding of employees' rights in the event of **transfers of undertakings**, businesses or parts of businesses<sup>29</sup> provides that rights and obligations that arise from a contract of employment or an employment relationship that exists on the date of a transfer, shall be transferred from the transferor, this is the one that ceases to be the employer, to the transferee (the 'new' employer, in short). The directive further provides that the transfer shall not constitute grounds for dismissal either by the transferor or the transferee. The Directive provides also that both the transferor and transferee must provide specified information to the representatives of employees affected by the proposed transfer and if either party envisages measures in relation to the employees their representatives must be consulted with a view to reaching agreement.

-The Directive relating to **collective redundancies**<sup>30</sup> provides that an employer who envisages collective redundancies must provide workers representatives with specified information concerning the proposed redundancies and must consult with the workers' representatives in good time with a view to reaching an agreement. These consultations should cover ways of avoiding or of reducing the redundancies and of mitigating their consequences by recourse to social accompanying measures aimed at, in particular, aid for redeployment and retraining of the redundant workers. the directive provides also for a notification of the public authorities of any projected collective redundancy and imposes that these collective redundancies shall take effect not earlier than 30 days after that notification.

-The Directive on **employer insolvency**<sup>31</sup> aims to provide minimum protection for employees in the event of the insolvency of their employer. It obliges MS to establish a body (guarantee institution) which guarantees the payment of employees' outstanding claims. Moreover, MS shall take the necessary measures to ensure that non payment of compulsory contributions due from the employer, before the onset of his insolvency, shall not adversely affect employees

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<sup>28</sup> Directive 2002/14/EC of the European Parliament and the Council of 11.3.2002, OJ L80 of 23.3.2002, p. 29

<sup>29</sup> Consolidated by Council Directive 2001/23/EC of 12.3.2001, OJ L 82 of 23.3.2001, p. 16.

<sup>30</sup> Consolidated by Council Directive 98/59/EC of 20.07.1998, OJ L 225 of 12.8.1998, p. 16.

<sup>31</sup> Council Directive 2002/74/EC of 23 September 2002, OJ L 270 of 8.10.2002, p.10

benefit entitlements in as much the employees' contributions were deducted at the source from their remuneration.

#### **At transnational level:**

- The Directive providing for the establishment of a *European works council* or a procedure for informing and consulting employees in Community-scale undertakings and groups<sup>32</sup> applies to undertakings or groups with at least 1000 employees and at least 150 employees in each of two Member States. It allows for the establishment of a European works council, representative of employees in the Member States where the group has operations, to be informed and consulted on the progress of the business and any significant changes envisaged.

- Three directives provide for the *involvement of employees* (i.e. information, consultation and participation to the supervisory board or board of directors) in companies adopting the European Company Statute<sup>33</sup>, the European Cooperative Society Statute<sup>34</sup> or deriving from a cross-border merger<sup>35</sup>.

Energy-intensive users claim that high prices, linked inter alia to an inefficient functioning of the gas and electricity markets, pose a real threat to their operations in the EU, compared to other countries, and increase the risk of job losses in the Union.

The above model simulations also provide results as regards potential overall employment effects. In case further liberalization mainly triggered a positive productivity effect, the employment impact could be slightly negative as the improvement in total factor would slightly outperform the expected output increase. In contrast, if liberalization led to a decline in the mark-up of incumbents only, a positive employment effect in the order of magnitude of 0.2 to 0.5% could be expected, with most additional jobs being created in the non-tradable and service sector.

Potential energy poverty is of concern in some Member States. Here, the further liberalisation of energy markets should have a positive effect as electricity and gas prices are expected to come down. On average, consumer prices are expected to decline by 0.2 to 0.4%. Given the higher share energy consumption makes up in the basket of poorer households such a decline could easily translate into the real disposable income of these households rising by one percentage point or more.

#### **5.15. Analysis of environmental effects**

The primary aims of the proposed regulatory changes are economic ones. However, repercussions on the environmental performance of the energy system and the European economy as a whole cannot be excluded. Indeed, two different mechanisms are expected to be at work that could have such repercussions.

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<sup>32</sup> Council Directive 94/45/EC of 22.9.1994, OJ L 254 of 30.9.1994, p.64.

<sup>33</sup> Council Directive 2001/86/EC of 8 October 2001 supplementing the Statute for a European Company with regard to the involvement of employees, OJ L294 of 10.11.2001 p.22

<sup>34</sup> Council Directive 2003/72/EC of 22 July 2003 supplementing the Statute for a European Cooperative Society with regard to the involvement of employees, OJ L207 of 18.08.2003 p.25

<sup>35</sup> Directive 2005/56/EC of the European Parliament and of the Council of 26 October 2005 on cross-border mergers of limited liability companies, OJ L310 of 25.11.2005 p1

The expected intensified competition is broadly expected to eliminate profits arising from a lack of competition on the internal market for electricity. As a consequence, effects on the electricity price introduced by the European Union Emission Trading Scheme (EU ETS) may become more pronounced and as such would convey a clearer and less distorted carbon price signal through electricity prices to the consumers. Electricity prices reflecting an undistorted carbon price signal would - through growing competition on the electricity market - also contribute to less carbon intensive generation of electricity, since electricity producers would - in the longer term - increasingly risk losing market shares, if they neglect the price signals accruing from the carbon market and more and more affecting overall power generation. Against this background, there is a clear and important complementarity between the creation of a competitive internal market for electricity and the environmental objectives aimed at by the European Climate Change Policy in general and the EU ETS in particular. Also the somewhat higher economic growth even when remaining modest would add to environmental pressure.

These factors might have an impact on the environment, especially on air pollution (CO<sub>2</sub>, sulphur dioxide, nitrogen oxides, and particulate matter). The impact of further electricity market liberalisation have been assessed for the year 2020 assuming a decrease in electricity prices of 8% in 2020 compared to the baseline. Table 1 summarises the impacts. On the basis of recent PRIMES runs performed for the Commission Services a decrease in the electricity price of 8% is expected to lead to an increase in electricity demand and generation of around 1.9% compared to the baseline. The baseline here is the most recent baseline of PRIMES of July 2007. Without additional measures this increase would imply an increase in fuel use and subsequent CO<sub>2</sub> emissions of 0.5%. However, since electricity generation is part of the EU-Emission trading scheme, CO<sub>2</sub> emissions are effectively capped and CO<sub>2</sub> emissions will not change. Since the demand for CO<sub>2</sub> permits increase the price might increase by around 4% to compensate for the increase in demand. The change in relative prices in favour of gas will in all likelihood trigger a fuel switching for the production of electricity in favour of this rather low-carbon fuel (as opposed to coal). This, in turn, might mitigate the positive impact of increased demand for electricity on the price of CO<sub>2</sub> allowances.

Intensified competition is also expected to improve the x-efficiency of power production and of the transmission system, thus, one unit of output might be produced with less fuel input. Moreover, the expected decline in gas prices should trigger some kind of fuel switching in favour of less polluting and less carbon-intensive fuels. Moreover, the incentive to connect new decentralised and renewable electricity producers to the grid is expected to strengthen due to the envisaged unbundling. All these effects should make the energy system more fuel efficient and support a fuel switching in favour of renewable and less carbon intensive and polluting fuels. As a result of the increase electricity generation emissions sulphur dioxide, nitrogen oxides and particulate matter will also increase. Assuming a proportional change in fuel use these impact have been assessed assuming a proportional change in these emissions in the power sector (starting from the baseline projection in the GAINS model<sup>36</sup>). The impact on the total EU wide emissions is small and ranges from an increase by 0.2% in sulphur dioxide, 0.1% in nitrogen oxides and 0.05% in particulate matter. The increase in practice will be smaller since the national emission ceilings Directive puts a cap on the total emissions of SO<sub>2</sub> and NO<sub>x</sub> per Member States which limits the expected increases.

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<sup>36</sup> See Amann, M. et al (2007) Updated baseline projections for the revision of the Emission Ceilings Directive of the European Union, NEC Scenario Analysis Report Nr. 4, IIASA, Laxenburg. (<http://www.iiasa.ac.at/rains/index.html>)



## Impact of electricity market liberalization on emissions in the EU27

|                         | CHANGE IN % IN 2020 |
|-------------------------|---------------------|
| CO2 emissions           | +0.0%               |
| Sulfur dioxide (SO2)    | +0.2%               |
| Nitrogen oxides (NOx)   | 0.1%                |
| Particulate matter (PM) | 0.05%               |

Source: Commission calculations

The impact of gas market liberalization on air pollution is unclear. On the one hand the gas price decrease will increase demand and hence CO2 emissions and especially NOX emissions. On the other hand the lower price of gas might lead to substitution of other fuels such as coal and oil in industry and the domestic sector. Since coal and oil have generally higher emissions per unit of fuel the net effect is unclear without detailed analysis.

Both mechanisms, if taken together, should have a rather neutral or a slightly positive effect on the environment and greenhouse gas emissions, especially in the longer run.

The effective large scale integration of intermittent and other non dispatchable energy sources into the electricity system is a problem which will need to be tackled both at transmission and distribution level. Furthermore, it will require some important transformations in the electricity market mechanisms which will realistically need to be implemented in stages. From the technical prospective, new energy sources (cogeneration, renewables, biomass) have very different characteristics. Therefore, any generalisation of the issues must be taken with some care.

The main large scale renewable energy sources (wind, solar and tidal) are often located far away from the point of consumption. On the contrary, CHP and small renewable energy sources will be located very close to the point of consumption. In both cases, they are either intermittent or non dispatchable. Economics suggest that they should therefore be used as far as possible when they are available.

As a consequence, in the future electricity system there will be need for:

- Increased long distance transmission capacity. This can be achieved initially with a better controllability of the power system (relatively cheap), but will also require a significant increase of the physical capacity.
- More load flexibility, to be achieved through demand side management techniques, flexible tariff structures, etc.
- Active distribution networks, (ie distribution which will be managed in a way very similarly to the transmission network)

Energy storage will have a role to play if its efficiency and cost can be made competitive.

Fortunately, most of these changes are the same which are required to favour the proper functioning of the internal electricity market.

### **5.16 Impact on third country investment**

The provisions on unbundling would be contained in the gas and electricity Directives. For EU Member States, the Commission can enforce unbundling through the certification procedure (to be followed, if necessary, by an infringement procedure); Member States have the responsibility to enforce unbundling. But the EU's ability to control and to enforce unbundling stops at the EU borders. Companies outside the EU, which want to invest in EU-based TSOs, would have to prove their compliance with unbundling rules to the Commission. The Commission is the adjudicating authority, but Member States will be required to actually enforce.

This enforces ownership unbundling also for TSOs owned by third country investors. (Shareholdings by third-country investors in TSOs remain only possible if it is proven that the investors are independent of supply interests.), ensures a level playing field for all TSOs and suppliers, deals with future and past investments by requiring all internal and external suppliers to sell investment in networks after a transitional period. The rule may however be difficult to implement if external supplier is already in possession of network. Forced network sale may be the only option, where the alternative of banning supply to the EU is undesirable.

A declaration that the energy sector is strategic sends a strong message that the European Union will defend its interests. It allows the Commission and Member States to block undesirable investments; allows the Commission and Member States to impose conditions on existing investments; allows for foreign equity participation but can protect investment projects. Major trading partners may be concerned, but have already taken similar measures. The US has placed its whole economy under such a protective measure, and Russia (as most producer countries) protects its energy sectors.

Measures on ownership and control certainly protect Member States from pressure. They provide also for a response in cases where ownership unbundling is ineffective because the 3<sup>rd</sup> country company is independent from an energy supply company but nevertheless directed and strategically controlled by the 3<sup>rd</sup> country government. It can be combined easily with the preceding proposal. It would normally not affect investment recycled through pension funds or other means, because minority shareholdings not leading to effective control would not be disallowed. The financing of minority stakes, such as by pension funds, would remain possible.

## SECTION 6: COMPARING THE OPTIONS

The analysis shows support from stakeholders on most options proposed by the Commission in its Communication on the Internal Market of 10 January 2007. The expected impact of such measures is also positive.

### 6.1. Further TSO unbundling:

The impact of proposed TSO unbundling options can be summarised as follows.

| Comparison of unbundling options                           | Full unbundling | ISO | Regulated unbundling |
|--|-----------------|-----|----------------------|
| Effects on competition                                     | ++              | +   | 0 or +               |
| Effects on investment                                      | ++              | +   | +                    |
| Effects on property/company ratings                        | 0               | 0   | 0                    |
| Effects on the behaviour of companies (non-discrimination) | ++              | +   | +                    |
| Effects on security of supply                              | +               | +   | +                    |
| Effects on cross-border trade                              | +               | +   | 0                    |
| Effects on prices in the long-term                         | + or ++         | +   | 0 or +               |
| Regulatory oversight                                       | +               | -   | --                   |

Some differences arise between these three solutions. Both full unbundling and ISO have positive effects when measured against the objectives set by the Commission in its 10 January communication. Nevertheless, complete separation of ownership between the transmission networks and generation/supply interests is the solution that offers the best guarantees from a competitive point of view. The level of regulation required to implement full unbundling is also lower than for an ISO and even more so than in the case of regulated unbundling. The proposal for "regulated unbundling" does not solve the inherent conflict of interest which is impossible to solve without excessively detailed and intrusive regulatory intervention.

The stakeholder consultation generally supported the need for enhanced TSO unbundling. Even allowing for the expected negative responses from integrated incumbents, there was general support for full unbundling because it would remove the fundamental conflict of interest in a network owner with merchant affiliates and guarantee non-discriminatory access. It was also felt that the creation of network-only businesses would make regulation easier. However, many respondents were quick to point out that there would be strong political opposition and the benefits were not self-evident or possible to quantify. Full unbundling might well be the preferred solution but it was not a sufficient condition for improving the competitive performance of the internal market. Many took the view that there was no shortage of capital or buyers to fund the acquisition of TSO assets and that incumbents should not be allowed to overstate the costs of full unbundling but commercial and political wrangling over details could result in significant delays and this could undermine the need for rapid progress in other areas e.g. cross border trading and market transparency. There was a general view that setting up ISO – particularly at the regional level – would be timely and costly process and that the incidence and costs of regulation could be greater than in the case of full unbundling.

Full ownership unbundling for TSOs has the following advantages:

- it solves inherent conflict of interest, promotes transparency and inspires trust in third parties.
- TSOs focus on efficient operation and network expansion  
Security of supply enhanced because investment disincentive removed
- Producers focus on efficient production and on new customers e.g. outside home markets.
- Better focus increases equity value, no expropriation
- Better investment climate for new entrants, as shows the. new LNG terminals in unbundled markets (such as the Netherlands and the UK).
- Easier (cross-border) TSO cooperation and mergers
- Dominant non-EU suppliers cannot purchase networks.

Concerning the question of ownership, full unbundling would not endanger security of supply. So far, in the case of ownership unbundled TSOs, state ownership is the rule. In 8 of the 13 Member States having ownership unbundling in electricity, the TSOs are fully state owned. The same is true for 4 of the 6 Member States having fully unbundled gas TSOs. In contrast, only the National Grid Company (electricity and gas TSO in England and Wales) and Enagas (the Spanish gas TSO) are almost fully privately owned TSOs. Private ownership of TSOs is also predominant in the case of the Italian and the Spanish electricity TSOs Terna S.p.A. and Red Electrica.

State ownership is also very common in the case of vertically integrated companies. In fact, E.ON is the only integrated energy company active in electricity which has almost no significant public shareholding (public ownership of 2.5%). In the gas sector, the large vertically integrated companies in Estonia, Hungary, Latvia, Sweden and some other German gas companies are (almost) completely privately owned.<sup>37</sup> It should be noted that some vertically integrated companies are partially owned by integrated energy companies located in other Member States. Examples are German EnBW in which EDF has a shareholding of 45.1%, Hungarian MOL in which Austrian OMV has a shareholding of 10% and the three Baltic gas TSOs in which both E.ON and Gazprom have important minority shareholdings ranging, in the case of E.ON, from 33.7% in Estonia, 38.9% in Lithuania to 47.2% in Latvia. This ownership structure requires particular attention if the effective unbundling of such integrated companies is put into effect by splitting off the network business and issuing shares for this network company to the shareholders of the previously integrated company ("share splitting option"). In this scenario, it has to be ensured that the new shares of the network companies are attributed to the shareholders of the network part of the integrated parent companies.

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<sup>37</sup> The public shareholding in the utility sector is usually quite large: RWE 31%, EnBW 50.9%, Verbund 71%, Gaz de France 80.2%, EdF 87.3%, Vattenfall 100%.

## 6.2. Enhancing the role of national regulators and co-ordination of regulators at EU level

The planned increase in regulators' powers should be extremely beneficial for competition, ensuring a level-playing field for companies in Europe. The legal uncertainty arising from different regulatory situations in the Member States hindered investment and competition, as it deterred new entrants to try and penetrate markets which were still perceived as closed. In addition, regulators who are totally independent should gain credibility when playing their role.

Increasing national regulators' powers is in general well perceived by stakeholders, even if some question the proportionality of such measures. Improved coordination between regulators would, according to stakeholders, be beneficial. Co-ordination introducing an ERGEG+ model gets considerable support, whereas the introduction of guidelines seems to be insufficient. Creating an EU regulator could be too intrusive and maybe not effective because good and proportional regulation needs a tailored approach requiring local presence. On the basis of the IA, it appears clearly that there is a strong support for both levels of improvements: reinforcement of the national level of regulation and creation of an EU level of regulation.

Some would argue that time has come to establish directly a European regulator without going through a transitional phase. The Commission services consider this idea not to be proportionate yet to the objectives to achieve and prefers to promote the idea of a transitional mechanism by the creation of a strong entity with the right powers (ERGEG +). This body should be able to take individual binding decisions; according to community law, if not exercised by the Commission itself, this power can only be granted to a Community agency.

Of the three options on coordination of national regulators, the Commission considered that the first, gradually developing the current approach, would not be sufficient, notably because progress would continue to be based on voluntary agreement between 27 national regulators which often have different interests. Thus, the minimum approach likely to make rapid and effective progress in harmonising the technical issues necessary to make cross-border trade work effectively would be the ERGEG+ approach. In general, experience suggests that it is doubtful whether coordination and integration can be achieved in the current framework where both TSOs and regulators are inclined or even obliged to follow a national focus.

| Comparison of co-ordination of regulators                  | ERGEG+ | European Regulator |
|--|--------|--------------------|
| Effects on consistency of regulation                       | +      | ++                 |
| Effects on competition                                     | +      | +                  |
| Effects on investment                                      | +      | +                  |
| Effects on the behaviour of companies (non-discrimination) | +      | +                  |
| Effects on security of supply                              | 0/+    | +                  |
| Effects on cross-border trade                              | +      | ++                 |
| Effects on prices in the long-term                         | 0/+    | 0/+                |
| Involvement of regulators                                  | ++     | -                  |

### **6.3. Co-ordination between TSOs**

Increasing TSO co-ordination as an instrument for influencing transmission operator policies in general receives support supported. Whereas stakeholders seem to think that defining guidelines for co-operation may not be sufficient, creating transborder TSOs was valued by some others as excessive compared to the objective of fostering TSO co-ordination. Granting more formal co-ordinating powers to the existing co-ordinating platforms ETSO and GIE, the "ETSO+/GIE+" option appears to be adequate for strengthening TSO co-ordination.

### **6.4. Increased transparency for wholesale markets**

Transparency is a key to successful market opening, both for electricity and gas, in particular to create a favourable environment for the development of competition. There was widespread support from stakeholders for more reliable and regular data to improve market transparency and liquidity in both gas and power wholesale markets. As a whole, a full range of data disclosure covering both capacity, storage, energy flow and trading data was supported and most respondents were unconvinced about worries over confidentiality and collusion. A unified approach to improving transparency based on a set of pan-European high level standards of data disclosure for gas and electricity would be very much welcomed by market players. This is also the conclusion of ERGEG's recommendations on enhancing transparency, and it is supported by transparency requirements established or being discussed in other liberalised markets like Australia or the USA.

### **6.5. Actions to regulate long-term contracts in gas**

Article 32(1) of Directive 2003/55/EC exempts long-term contracts for gas transmission concluded pursuant to Article 3(1) of Directive 91/296/EEC. However, at this stage, further legislative measures concerning long-term contracts in gas do not appear to be proportionate.

### **6.6. Access to gas storage facilities**

The level of competition on the gas storage market (gas storage services) could be effectively increased by implementing two policy actions in particular: imposing legal unbundling and, a formal implementation of current ERGEG guidelines on gas storage operations. The stakeholder consultation process acknowledges the possible benefits of implementation. Stakeholders think that the policy measures can indeed contribute to the goals of a competitive market with a sufficiently high level of security of supply. In addition, the stakeholder respondents seem to agree that the policy measures are necessary and proportional. The impact assessment shows that both measures would improve the contestability of the market, to the benefit of potential new gas storage investors (due to higher market transparency) and gas consumers in need of storage services (large industrial gas consumers for example). In addition, this positive impact on overall investment level regarding gas storage also increases the level of security of supply.

### **6.7. Strategic gas stocks**

The Commission will look further into the potential benefits that could be expected from creating strategic stocks for gas at EU level. So far, there does not seem to be support from stakeholders for legal measures at Community level.

The Commission services consider, at this stage, that options 2 and 3 (improve existing mechanism by imposing more transparency and reporting obligation on the level of

commercial stocks; create a solidarity mechanism at regional level between Member States) are the best intermediate options to address the security of supply objective at EU level. Option 1 (mandatory strategic stocks) will be examined in more detail in the coming months with a specific study from the Commission.

## **6.8. Changes to the framework for investment in gas import infrastructures**

The adaptation of Article 22 for investment in gas infrastructure, for the criteria for TPA exemptions, an improvement of regulatory processes surrounding the building of gas infrastructure through the creation of a ‘one-stop-shop’ and an increase in coordination on large priority investment projects are likely to contribute to a more positive investment climate. Stakeholder response indicates that only small share of stakeholders are pessimistic regarding the impact of such actions. An increase in overall coordination on the realization of large priority infrastructure projects is deemed necessary by most stakeholders.

The baseline scenario would lead to increasing national differences in the application of the exemption requests for new infrastructure projects. Some Member States may become excessively generous to grant exemptions and thus risk a partial foreclosure of the gas market and a strong discrimination between assets with third party access and exempted ones. Specifying and clarifying the legislative framework for these exemptions through specific guidelines would reduce this risk and would be favourable for the treatment of cross-border exemption requests. To achieve a more homogeneous approach it is moreover advisable to attribute to the new Agency for the Coordination of Energy Regulators the task of granting exemption requests for pipelines crossing more than one Member State.

## **6.9. DSO unbundling**

.Further DSO unbundling does not seem to bring sufficient added value at this stage. Due to the recent entry into force of the last liberalisation date in a number of Member States, it would seem to be premature to go a step further in forcing unbundling in this activity. In addition, this was only supported by a minority of respondents in the consultation, as there seems to be a widespread perception that enforcement of current legislation should be the priority. It should be noted that there is a clear case for increasing the powers of national regulators over this area and the idea of revising the 100.000 threshold should not be ruled out.

## **6.10. Further actions relates to consumer protection**

Taking action to strengthen the information position of consumers is in general strongly supported. However attention should be paid to the fact that new initiatives do not hamper existing commercial or public initiatives, such as price comparison tools. There is a general strong support for the provision of information on protection against unfair selling practices by energy suppliers. Improving switching procedures also gets strong support from market entities since low switching barriers are seen as an important requisite for market contestability, which is beneficial for consumers.

As a whole, energy market integration would have an important impact on growth and jobs. A recent study by Copenhagen Economics (2007) has estimated that the effects of market opening in electricity will reduce prices for electricity by 13 % and increase cross-border trade by 31%. This would have significant positive effects on consumers and producers further down the value chain, overall increasing EU GDP by 0.3-0.5% and creating some 50,000-120,000 jobs.

### **6.11. Control of third country investment in EU networks**

Generally, investment in the gas and electricity networks in the EU is welcome as these networks need renewal and expansion to accommodate for new types and sources of primary energy. Also third country investments can, under certain conditions, be regarded as beneficial. Where the involvement of third country companies undermines effective TSO unbundling or where investment is driven by other motives than economic ones, it may counteract the pro-competitive effect of unbundling and jeopardise security of supply. The concern about third country investment is expressed mostly in relation to gas networks since third countries already have strong positions in the gas supply to the EU, but is also applicable to electricity as the inherent conflict of interest is the same in both sectors. Three approaches are conceivable to control third country investment in EU networks. Firstly, a restriction of the ownership of third country companies in EU networks. This approach has to take into account the international obligations of the Community and the Member States vis-à-vis third countries as well as the internal market principles of non-discrimination and the free movement of capital. Secondly, a regulatory approach can be envisaged whereby the independence of a candidate TSO is monitored at national and/or European level. Thirdly, a declaration that the energy sector is strategic sends a strong message that the European Union will defend its interests.

A combination of regulatory measures could ensure that the strategic importance of the EU gas and electricity networks is properly taken into account and that the EU unbundling requirements are correctly respected also by third country companies.



**6.12. The comparison of options led the Commission services to draw up a summary table of its proposed actions:**

| <b>Issue</b>                           | <b>Proposed Action ?</b>  |
|--|---|
| TSO unbundling                         | YES – modify Directives   |
| Increase powers of NRAs                | YES- modify Directives  |
| Coordination of regulators             | YES – new body and modify Regulations   |
| TSO co-operation                       | YES – modify Directives, plus a Commission Decision   |
| Transparency                           | YES – modify Regulations  |
| Long-Term contracts                    | NO – rely on existing Competition Law   |
| Access to storage                      | YES- modify Directive   |
| Strategic Storage                      | NO – but this may change in the light of the Commission study to be launched in the near future |
| Infrastructure investment              | YES – new guidelines and improved procedure   |
| DSO unbundling                         | NO – keep basic rules, but increase regulatory powers   |
| Consumer Protection and Energy Poverty | YES – increase energy awareness and household competition                                       |
| Third country investment               | YES – combination of regulatory measures to ensure effective unbundling of non-EU investors     |

## SECTION 7: MONITORING AND EVALUATION

Commission implementation reports will be one of the bases to measure progress towards achieving the ultimate goal of creating competitive, secure and sustainable EU energy markets.

As far as TSO unbundling is concerned, the following indicators will be used to assess the fulfilment of objectives (Ensure non-discriminatory third party access to transmission networks for upstream and downstream customers,. Encourage sufficient investment in capacity): Investments, Allocation of congestion revenues,. Transmission system performance data, Volumes traded on spot and OTC markets, Commission infringement proceedings. Other indicators suggested by stakeholders included: (evolution of) price levels, number of new entrants, market shares of new entrants, available capacity at cross-border interconnections, number of claims regarding non-discriminatory access to the network

For the strengthening of regulators' powers, the indicators could be: Commission implementation reports, Market share of new entrants, Shareholding of DSOs, Cross-border trade activities, Consumer satisfaction index, Number of complaints, Delay to process TPA request, Network tariffs (transmission and distribution), Delays to make regulatory decisions, Switching statistics.

Concerning the increased cooperation of regulators, the facilitation of investments in cross-border and gas import infrastructure and the Co-ordination of application of Regulation 1775/2005 and Regulation 1228/2003 would be pertinent.

On improved transparency, the indicators would be Regulators, ETSO and GTE reports into Wholesale market competitiveness (HHI), Market share fluctuations, Number of entrants, Price volatility, Neighbouring markets price differences, Transparency of price, production and consumption data

For long-term gas contracts, the indicators could be Concentration indices in combination with the number/scope of long term contracts, Open season and auctioning data, Tradability of network capacity rights.

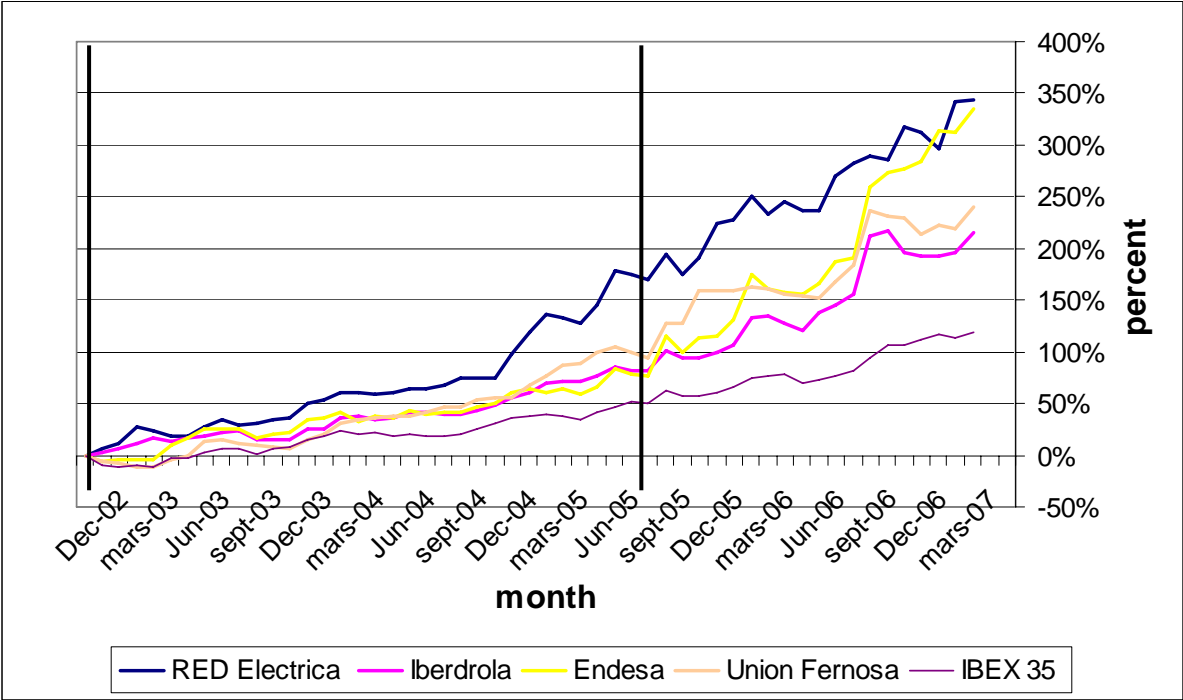
For gas storage, the Commission would use Regulator and TSO data pertaining to Rotation of stocks, Number of users, Use it or lose it (UIOLI) principle applied, Availability of storage facilities, Investment in storage facilities, the availability of flexibility tools (as a substitute for storage facilities)

For the coordination of TSOs, the Commission would base its assessment on Regulator and ETSO / GTE reports on Black-outs, Congestion management, Capacity improvement of interconnections and gas import infrastructure, Level of investments, Transparency on capacities and flows, Co-ordination of business rules and capacity bookings on borders.

For consumer choice, the Commission would rely on Regulator data concerning the Number of switching households (in combination to smart metering), Price volatility, Consumers confidence, Fuel poverty, Customer complaints.

**Annex I: Development of stock prices after unbundling**

Figure A1: Development of stock prices in the Spanish electricity sector, adjusted for dividends



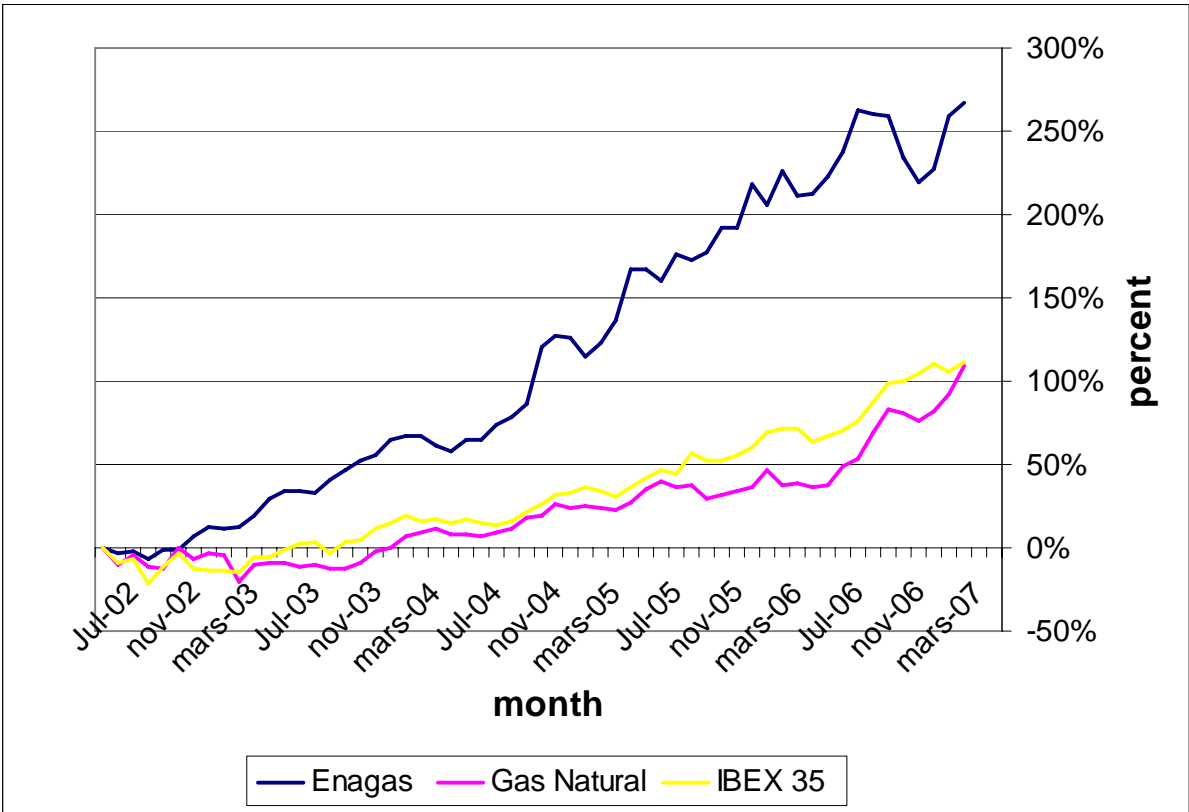
Source: Yahoo finance; own calculations

**Electricity:**

Ownership restrictions for shareholdings in RED Electrica for companies operating in the electricity sector: 10% (November 1997), 3% (December 2002), 1% (March 2005)

Acquisition of transmission network assets by RED Electrica: from Iberdrola (25% share, 75% hold by financial investor CVC capital), Union Fenosa and Endesa (November 2002), from Enel Viesgo (November 2004), Iberdrola (remaining 75% share, February 2005)

Figure A2: Development of stock prices in the Spanish gas sector, adjusted for dividends



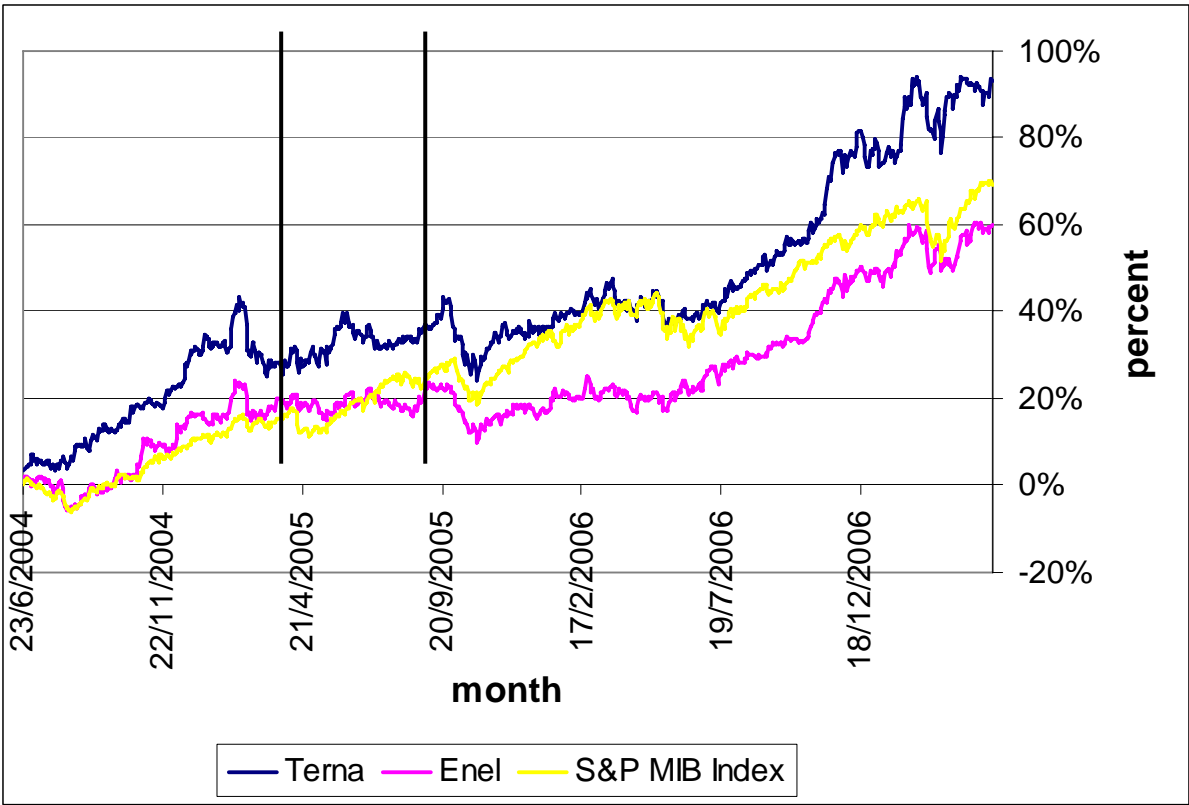
Source: Yahoo finance; own calculations

**Gas:**

Ownership restriction of 35% (June 2000) respectively 5% (December 2002) for shareholdings in Enagas by the end of 2006

Gas Natural subsidiary Enagas sold step by step: 59% (2002 June), 2,3% (2003), 12.5% (2004), 13,3% (2005)

Figure A3: Development of stock prices in the Italian electricity sector, adjusted for dividends



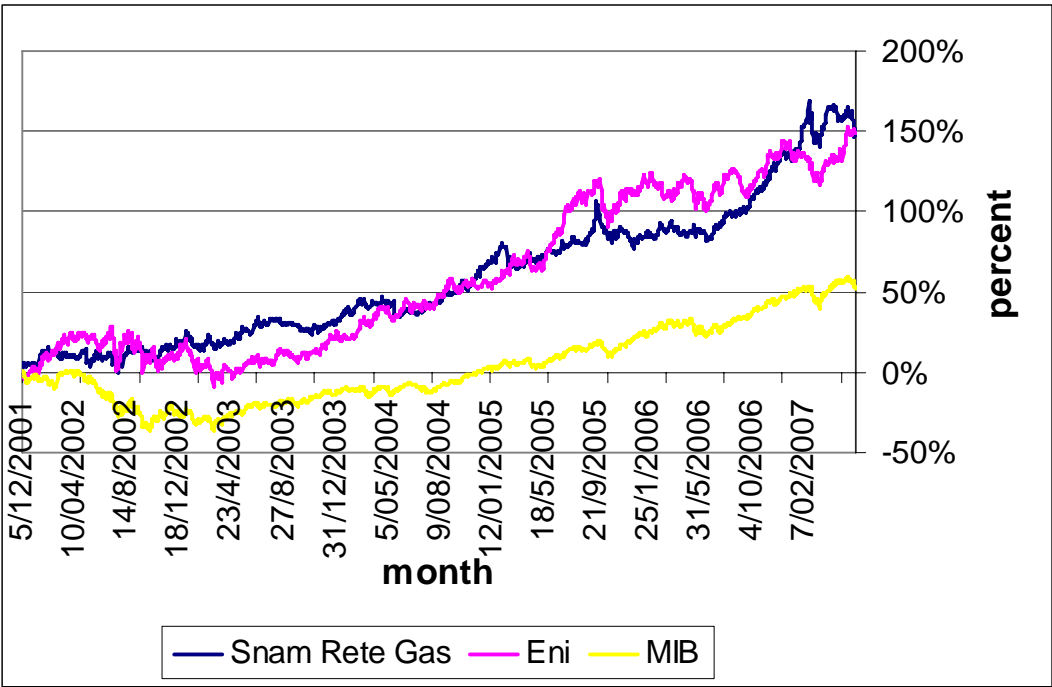
Source: Datastream; own calculations

Ownership restriction for shareholdings in Terna for companies operating in the electricity or gas sector of 20% after July 2007 (2003)

Enel subsidiary Terna sold step by step: 50% (July 2004), 13.86% (March 2005), 29.99% (September 2005)

Unification of network owner (Terna) with network operator (Gestore della Rete di Trasmissione Nazionale) (November 2005)

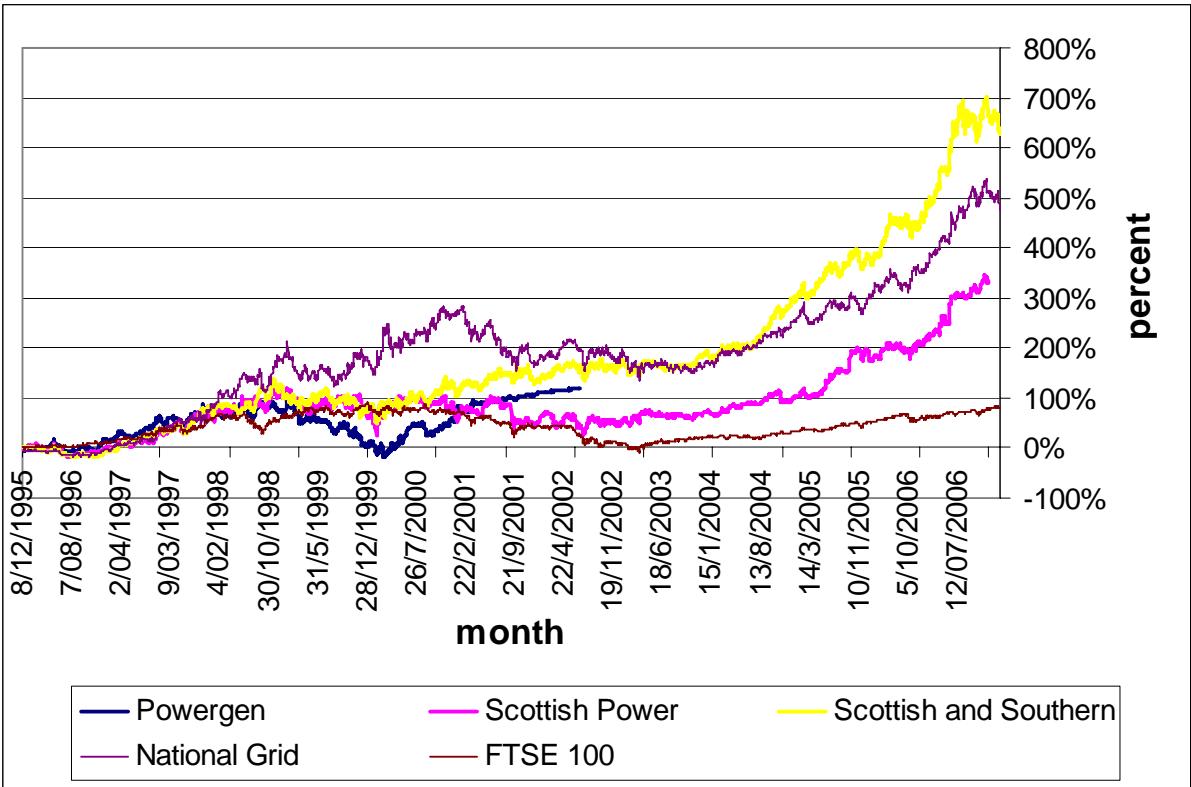
Figure A4: Development of stock prices in the Italian gas sector, adjusted for dividends



Source: Datastream; own calculations

Snam Rete Gas S.p.A. set up as subsidiary of Eni (15.11.2000); listed on stock exchange (6.1.2001); free float (2.5.2007) 37.72% (50.04% still controlled by Eni)

Figure A5: Development of UK stock prices in the electricity sector

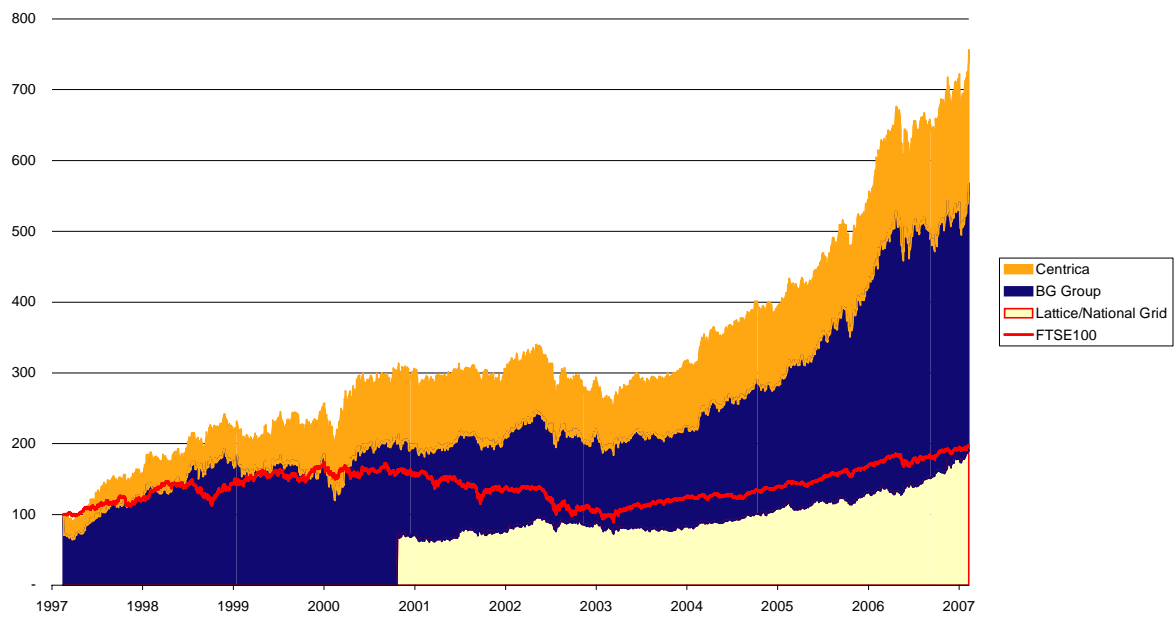


Source: Datastream; own calculations

**Electricity:**

National Grid Company founded as electricity TSO (1990) and listed at stock exchange (1995)

Figure A6: Development of UK stock prices in the gas sector (1997 – 2007)



Source: DTI UK

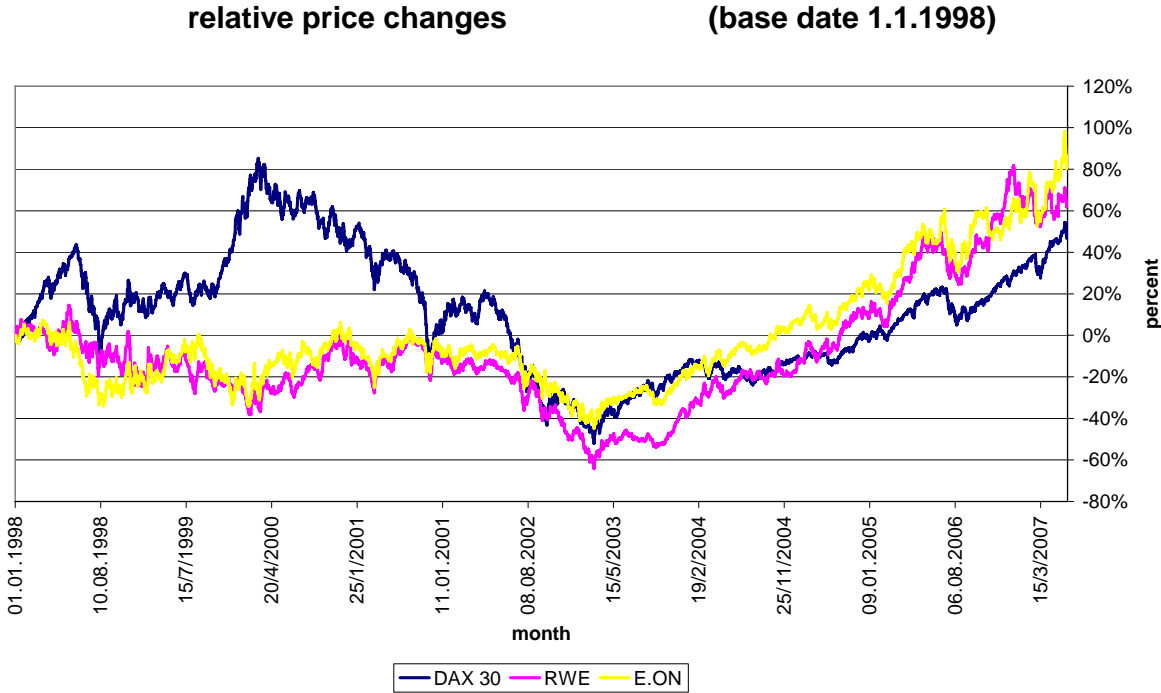
**Gas:**

Merger of National Grid and Lattice completed (October 2002)

National Grid sold 4 gas distribution networks (4 still remain with National Grid) (June 2005)



Figure A7: Development of stock prices in the German utility sector



Source: Datastream; own calculations

## Annex II: Development of market shares after unbundling

Table A1: Market share of the largest generator in the electricity market<sup>38</sup>

|  | 1999        | 2000        | 2001        | 2002        | 2003        | 2004        | 2005        |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>countries with legal unbundling</b>     |             |             |             |             |             |             |             |
| Belgium                                    | 92,3        | 91,1        | 92,6        | 93,4        | 92          | 87,7        | 85          |
| Estonia                                    | 93          | 91          | 90          | 91          | 93          | 93          | 92          |
| Ireland                                    | 97          | 97          | 96,6        | 88          | 85          | 83          | 71          |
| Greece                                     | 98          | 97          | 98          | 100         | 100         | 97          | 97          |
| France                                     | 93,8        | 90,2        | 90          | 90          | 89,5        | 90,2        | 89,1        |
| Latvia                                     | 96,5        | 95,8        | 95          | 92,4        | 91          | 91,1        | 92,7        |
| Hungary                                    | 38,9        | 41,3        | 39,5        | 39,7        | 32,3        | 35,4        | 38,7        |
| Poland                                     | 20,8        | 19,5        | 19,8        | 19,5        | 19,2        | 18,5        | 18,5        |
| <b>average</b>                             | <b>78,8</b> | <b>77,9</b> | <b>77,7</b> | <b>76,8</b> | <b>75,3</b> | <b>74,5</b> | <b>73,0</b> |
| Germany (largest)                          | 28,1        | 34          | 29          | 28          | 32          | 28,4        | n/a         |
| Germany (CR3)                              |             |             | 63          | 66          | 66          | 66          | 66          |
| Germany (CR5)                              |             |             | 72          | 75          | 80          | 80          | 79          |
| <b>countries with ownership unbundling</b> |             |             |             |             |             |             |             |
| Czech Republic                             | 71          | 69,2        | 69,9        | 70,9        | 73,2        | 73,1        | 72          |
| Denmark                                    | 40          | 36          | 36          | 32          | 41          | 36          | 33          |
| Finland                                    | 26          | 23,3        | 23          | 24          | 27          | 26          | 23          |
| Italy                                      | 71,1        | 46,7        | 45          | 45          | 46,3        | 43,4        | 38,6        |
| Lithuania                                  | 73,7        | 72,8        | 77,1        | 80,2        | 79,7        | 78,6        | 70,3        |
| Portugal                                   | 57,8        | 58,5        | 61,5        | 61,5        | 61,5        | 55,8        | 53,9        |
| Slovakia                                   | 83,6        | 85,1        | 84,5        | 84,5        | 83,6        | 83,7        | 83,6        |
| Spain                                      | 51,8        | 42,4        | 43,8        | 41,2        | 39,1        | 36          | 35          |
| Sweden                                     | 52,8        | 49,5        | 48,5        | 49          | 46          | 47          | 47          |
| United Kingdom                             | 21          | 20,6        | 22,9        | 21          | 21,6        | 20,1        | 20,5        |
| <b>average</b>                             | <b>54,9</b> | <b>50,4</b> | <b>51,2</b> | <b>50,9</b> | <b>51,9</b> | <b>50,0</b> | <b>47,7</b> |

Source: Eurostat. For Germany (CR3 and CR5), Schwarz, H.-G., Lang, Ch.: Marktstruktur und Konzentration in der deutschen Stromerzeugung, in: *Energiewirtschaftliche Tagesfragen* 55 (12), 864-870 (2005)

Notably, the electricity grid in Hungary was between 2003 and 2005 operated in a manner which could be considered to constitute an ISO model. However, in 2006, the ISO was reintegrated in a vertically integrated company.

<sup>38</sup>

The Commission services decided to use EUROSTAT figures rather than those from the Competition Sector Enquiry as they were available for several consecutive years, applying the same methodology and therefore giving a useful basis for comparisons

### Annex III: Development of network investment of TSOs

| TSO   | MS        | currency   | 1995           | 1996 | 1997 | 1998 | 1999 | 2000  | 2001  | 2002  | 2003   | 2004   | 2005   | 2006   |       |
|---|-----------|--|----------------|------|------|------|------|-------|-------|-------|--------|--------|--------|--------|-------|
| <b>Red Electrica de Espana</b>                                      | <b>ES</b> | Investment in transmission grid                  | (mill. €)      |      |      |      |      |       |       | 203   | 215    | 243    | 420    | 510    |       |
| <b>Terna SpA</b>  | <b>IT</b> | Investment in tangible fixed assets              | (mill. €)      |      |      |      |      |       | 191   | 164   | 240    | 278    | 259    | 319    |       |
| <b>CEPS</b>   | <b>CZ</b> | Investment (excl. financial invest.)             | (in mill. CSK) |      |      |      |      | 628,3 | 781,2 | 506,6 | 1388,3 | 1232,2 | 1462,8 | 2348,1 |       |
| <b>Lietuvos Energija AB (electricity)</b>                           | <b>LT</b> | Investment                                       | (mill. LTL)    |      |      |      |      |       |       | 120   | 149    | 145    | 129    | 156    |       |
| <b>National Grid Electricity Transmission plc Gasunie incl. GTS</b> | <b>UK</b> | Replacement, reinforcement, growth and extension | (mill. £)      |      |      |      |      |       | 371   | 391   | 426    | 395    | 526    |        |       |
| <b>Enagas</b>   | <b>ES</b> | Investment in grid, LNG and storage              | (mill. €)      |      |      | 104  | 84   | 70    | 57    | 67    | 83     | 97     | 114    | 257    | 529   |
| <b>Transco / National Grid Gas</b>                                  | <b>UK</b> | Investment                                       | (mill. £)      |      |      | 147  | 191  | 140   | 228   | 239   | 182    | 159    | 128    | 359    | 444   |
| <b>REN</b>  | <b>PT</b> | Investment                                       | (mill. €)      | 93,7 | 90,6 | 76,4 | 57,1 | 63,9  | 54,9  | 81,7  | 110,3  | 127,1  | 144,4  | 222,2  | 243,7 |
| <b>REN</b>  | <b>PT</b> | Investment (see footnote)                        | (mill. €)      | 93,7 | 90,6 | 76,4 | 57,1 | 63,9  | 53    | 81,5  | 110,2  | 118,4  | 123    | 173,6  | 189,9 |
| <b>GDF/GRT</b>  | <b>FR</b> | Network investment in France                     | (mill. €)      |      |      |      |      |       |       |       | 970    | 983    | 1 200  | 1 400  |       |
| <b>Snam Rete Gas</b>  | <b>IT</b> | Investment                                       | (mill. €)      |      |      |      |      |       | 429   | 385   | 505    | 574    | 685    | 675    |       |
| <b>RTE</b>  | <b>FR</b> | Investment                                       | (mill. €)      |      |      |      |      |       | 651   | 616   | 535    | 538    | 582    | 638    |       |
| <b>All German electricity TSOs</b>                                  | <b>DE</b> | Investment in network only                       | (mill. €)      | 3600 | 3100 | 3000 | 2700 | 2500  | 2000  | 2200  | 1800   | 1700   | 2 000  | 2500   |       |

Explanation: shaded cells indicate years in which the respective companies were ownership unbundled. In the case of the Portuguese TSO REN, the second set of figures excludes the investment necessary to fulfil obligations for regional integration and connection of renewables. Source: Annual reports of the respective companies and in the case of Germany ATKearney study (2007): Liberalisierung des deutschen Strommarktes – Wer profitiert, wer verliert?

#### Annex IV: Relationship between the measures proposed on 10 January and the structural problems of the energy markets

| <b>Problems</b><br>→<br><b>Measures</b>    | <b>Market concentration</b>                          | <b>Vertical foreclosure</b>                            | <b>Lack of market integration</b><br>(cross-border and national) | <b>Lack of transparency</b><br>(insufficient info e.g. on generation & capacities) | <b>Distorted price formation</b> (e.g. regulated prices, cross-subsidies) | <b>Downstream market foreclosure</b><br>(access to customers) | <b>Security of supply</b><br>(investment, network security & reliability) |
|--|--|--|--|--|---|---|---|
| <b>TSO unbundling</b>                      | Improves TPA and thus market entry                   | tackles problem at the root                            | facilitates TSO cooperation and mergers                          | eliminates preferential information flows  | eliminates cross-subsidies  | N/A   | Promotes e.g. interconnection investment                                  |
| <b>Strengthen NRA</b>                      | To ensure level playing field; VPP, gas release      | To better monitor unbundling obligations               | To monitor management of interconnection capacity                | To monitor transparency obligations  | To monitor cross-subsidies and determine tariffs                          | To monitor access to customer data                            | To monitor investment in grid & generation                                |
| <b>ERGEG+</b>                              | Indirect effect                                      | Indirect effect  | closes regulatory cross-border gap, oversees ETSO+/GTE+          | oversees ETSO+/GTE+  | Indirect effect   | Indirect effect   | To assess cross-border Art. 22 requests                                   |
| <b>ETSO+/ GTE+</b>                         | To improve interconnection and create larger markets | To develop common rules on TPA and grid connection     | To develop market and technical codes, coordinate grid operation | To develop market and technical codes, rules on trading & transparency             | To improve interconnection and thus liquidity                             | N/A   | 10-year investment plan, security and reliability rules                   |
| <b>Transparency obligations</b>            | To facilitate market entry                           | To overcome information advantage of integrated groups | To facilitate market entry                                       | tackles problem at the root  | To reveal cause of price deformation                                      | To overcome information advantage of integrated groups        | To increase network security & reliability                                |
| <b>Access to storage and LNG terminals</b> | To improve TPA and thus market entry                 | Legal unbundling if essential fac., UIOLI              | Free trading of capacity rights                                  | Info obligation on storage services  | Obligations on terms & conditions for access                              | UIOLI, secondary market trading                               | Efficient & maximum use of capacity, open seasons & UIOLI for Art. 22     |
| <b>DSO unbundling</b>                      | To improve TPA and thus market entry                 | strengthen resources of DSOs                           |  | NRA to monitor transparency obligations  | To strengthen compliance officers, NRA to                                 | to eliminate brand confusion; NRA to                          | N/A   |

|  |  |  |  |  |                         |                                 |  |
|--|--|--|--|--|-------------------------|---------------------------------|--|
|  |  |  |  |  | monitor cross-subsidies | monitor access to customer data |  |
|--|--|--|--|--|-------------------------|---------------------------------|--|

N/A means that a certain measure does not have a direct effect on respective fundamental problem

Shaded fields indicate which more detailed measures are envisaged in the package to tackle the respective fundamental problem

**Measures needed but not envisaged in the 3<sup>rd</sup> package legislation or of a different nature**

|                             |   |
|-----------------------------|---|
| <b>(limit) LT-contracts</b> | This measure would tackle some of the above problems of the energy markets by facilitating market entry and increasing liquidity and transparency. However, competition law is considered the more suitable tool to achieve this objective. |
| <b>Strategic storage</b>    | This measure would improve in particular the security of supply objective. However, the measure needs further assessment and may be proposed at a later stage.  |
| <b>Consumer protection</b>  | This measure is not meant to tackle the above problems but results from the existence of the above problems. The causality is thus different than for the other measures proposed. It does therefore not fit in the above table.            |

## Annex V: Views of stakeholders on the impact of proposed policy measures

The following tables summarise stakeholders' views on the impact of proposed policy measures as collected during the consultation, for each main issue.

### Further TSO unbundling

| Summary of economic, environmental and social effects     |        |  |
|---|--------|--|
| Economic impacts  |        | Stakeholders views   |
| Public sector cost of regulation (lower cost = positive)  | o /    | Enforcing full ownership unbundling or the creation of independent transmission system operators will initially lead to moderate extra costs of regulation. Subsequently the need for regulatory intervention may be less what will lead to lower costs of regulation. The consultation results however show that doubt may exist as to this latter effect.  |
| Private sector (compliance) costs (lower cost = positive) | o /    | Regarding the costs of compliance the picture is not clear. The effect on transmission costs may be moderate (in the range of 1-5%). It is however not clear what divesting TSO assets will have on the 'donor' companies.   |
| Private sector investments (arithmetic indicator)         | ++ / + | The restructuring of the energy transmission sector invoked by the amended legal framework may result in additional investments in transborder capacity in order to remove current shortages. For a substantial period this could result in higher investment levels. Doubts have been raised regarding the size of this effect. Interviews show that the effect may be less strong in the case of full ownership unbundling than in the case of ISO creation. |
| Public sector spending (lower spending = positive)        | o      | Public sector spending probably will not be influenced by the identified policy initiatives.   |
| Energy markets contestability (contestability = positive) | + / o  | The amended regulation probably will result in lower transborder problems and better integrated EU energy markets. If this is the case this will improve markets contestability and will have a positive effect on economic growth.  |
| Economic growth (growth = positive)                       | + / o  |  |
| Energy prices (lower prices = positive)                   | + / o  | Better integration and increased contestability of the EU energy markets probably will have a positive effect on energy prices.  |
| Environmental impacts                                     |        | Stakeholders views   |
| Modal shift (sustainable = positive)                      | + / o  | Better integrated high capacity transmission networks may foster the use of sustainable energy.  |
| Emissions (lower emission = positive)                     | o / -  | More reliable and lower priced provision of energy may have a positive effect on the volume of consumption. This effect may not be compensated by the positive effects of the amended regulation on the modal shift.   |
| Social impacts  |        | Stakeholders views   |
| Employment (arithmetic indicator)                         | + / o  | As a result of increased efficiency of the energy sectors employment in the sector may go down. It is likely that this effect will be more than compensated by the positive effects of economic growth on employment.  |
| Consumer protection (public aid = positive)               | o      | The amended regulation does not effect consumer protection.  |

|   |       |   |
|---|-------|---|
| Security of supply (secure supply = positive)                                 | + / o | The improved integration and capacity of energy transmission networks resulting from the amended regulation may have a positive effect on security of supply. |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |       |   |

## Enhancing the role of national regulators

| Summary of economic, environmental and social effects     |       |  |
|---|-------|--|
| Economic impacts  |       | Stakeholders views   |
| Public sector cost of regulation (lower cost = positive)  | -     | The public sector cost of regulation may increase substantially. Regulators need additional staff, housing, management, IT, etc. Notification of certain regulator decisions to the Commission will lead to (rather low) extra costs for the regulator and for the Commission.   |
| Private sector (compliance) costs (lower cost = positive) | o     | More regulator powers probably will have no significant effect on private sector compliance costs. In fact regulators get more power to enforce what is already required from the current Directives.  |
| Private sector costs / investments (arithmetic indicator) | o     | Probably the defined actions will have no significant influence.   |
| Public sector spending (lower spending = positive)        | o     |  |
| Energy markets contestability (contestability = positive) | + / o | Strengthened regulator powers may decrease market distortions resulting in more competitive energy markets. However some doubt regarding the necessity and proportionality has been observed.  |
| Economic growth (growth = positive)                       | + / o | If the considered intervention leads to enhanced competition this will have a positive effect on energy prices and economic growth.  |
| Energy prices (lowerprices = positive)                    | + / o |  |
| Environmental impacts                                     |       | Stakeholders views   |
| Modal shift (sustainable = positive)                      | o     | Probably no effects.   |
| Emissions (loweremission = positive)                      | o / - | Lower energy prices may lead to some extra consumption of energy. However, other costs (oil, taxes) will influence this pattern.   |
| Social impacts  |       | Stakeholders views   |
| Employment (arithmetic indicator)                         | + / o | Due to consolidation and increased competitiveness employment on the internal energy markets may decrease. However, this effect is coherent to the desired competitive markets, forcing companies to work more efficient. This negative impact on the employment will be exceeded by the positive impact the better functioning markets may have on other markets and the trans-European competitive position of European economies. |
| Consumer protection (public aid = positive)               | +     | The considered strengthening of regulator powers will enlarge regulator options for effective consumer protection.   |
| Security of supply (secure supply = positive)             | +     | A more effective functioning energy market is better capable of allocating scarce resources (on time), and therefore improves investment decision making on generation and infrastructure assets. Hence, security of supply increases.   |

++ = strong positive + = positive o = neutral -= negative --= strong negative

## Increased coordination of regulators at EU level

| Summary of economic, environmental and social effects                         |        |   |
|---|--------|---|
| Economic impacts  |        | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive)                      | o /    | Changing the regulatory structure will cause the central costs regulation to go up whereas the regulatory costs in member states may (in the long run) go down.   |
| Private sector (compliance) costs (lower cost = positive)                     | o /-   | Adding central functions to the regulation may result in costs of compliance that are not fully compensated by lower national costs of compliance.  |
| Private sector investments arithmetic indicator                               | ++ / + | The revised regulatory arrangements are designed to boost investments in (transborder-) transmission capacity.  |
| Public sector spending (lower spending = positive)                            | o /    | Government may support the effects of modified regulatory intervention by creating co-funding and risk sharing arrangements. This will probably increase public spending.   |
| Energy markets contestability (contestability = positive)                     | + / o  | Removing (transborder-) bottlenecks in the energy transmission networks will improve the contestability of energy markets and will result in a better conditions for competing market players.  |
| Economic growth (growth = positive)   | + / o  | More competition driven energy markets will be beneficial for economic growth. Higher transmission costs will probably be more than compensated by the effects of enhanced competition on energy prices.  |
| Energy prices (lower prices = positive)                                       | + / o  |   |
| Environmental impacts   |        | Stakeholders views  |
| Modal shift (sustainable = positive)  | + / o  | An integrated and reliable energy network with sufficient capacity will support an increase of the use of sustainable energy sources.   |
| Emissions (lower emission = positive)   | o /-   | Lower energy prices resulting from more efficient energy markets may lead to lower pressure to reduce energy consumption. However, other costs (oil, taxes) will influence this pattern.  |
| Social impacts  |        | Stakeholders views  |
| Employment (arithmetic indicator)   | o / +  | Employment in more contestable and more competitive energy markets may go down as a result of increased efficiency. This effect probably will be exceeded by the positive effect of better functioning energy markets on other markets and the trans-European competitive position of European economies. |
| Consumer protection (public aid = positive)                                   | o      | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                 | + / o  | Better transmission networks will result in improved security of supply.  |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |        |   |

## Increased TSO coordination

| Summary of economic, environmental and social effects |   |   |
|---|---|---|
| Economic impacts                                      |   | Stakeholders views  |
| Public sector cost of regulation (lower               | o | The public sector costs are limited to the introduction of new regulation and therefore |



|   |        |   |
|---|--------|---|
| cost = positive)  |        | are expected to be (very) low.  |
| Private sector (compliance) costs (lower cost = positive)                     | -      | The sector co-ordination and co-operation costs will increase but the amount of extra costs will be limited.  |
| Private sector investments (arithmetic indicator)                             | ++ / + | If successful, the implementation of enhanced co-operation arrangements will lead to considerable extra investments in transmission capacity.   |
| Public sector spending (lower spending = positive)                            | o      | No impact expected.   |
| Energy markets contestability (contestability = positive)                     | ++ / + | If successful, the implementation of enhanced co-operation arrangements will lead to considerable contribute to creating conditions favourable for developing competition driven energy markets.  |
| Economic growth (growth = positive)   | +      | Better functioning energy markets will have a positive influence on economic growth. Further, as a result of better functioning energy markets energy prices will get closer to the cost of energy sources.   |
| Energy prices (lower prices = positive)                                       | +      |   |
| Environmental impacts   |        | Stakeholders views  |
| Modal shift (sustainable = positive)  | o      | Improved market efficiency probably will not have a significant effect on the use of renewable energy sources.  |
| Emissions (lower emission = positive)   | o      | Lower prices resulting from more efficient energy markets may lead to somewhat lower pressure to reduce energy consumption. However, other costs (oil, taxes) will influence this pattern.  |
| Social impacts  |        | Stakeholders views  |
| Employment (arithmetic indicator)   | o / +  | The improved efficiency of energy markets resulting from the policy package may have a negative effect on employment in the sector. This negative effect is however expected to be more than compensated by employment effects of economic growth in general. |
| Consumer protection (public aid = positive)                                   | o      | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                 | ++ / + | Better market information will foster better planning of allocation of capacities and thus may have a significant positive effect on security of supply.  |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |        |   |

## Increased transparency for wholesale markets

| Summary of economic, environmental and social effects    |     |   |
|--|-----|---|
| Economic impacts   |     | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive) | o / | Apart from the design of regulation and the costs of implementation, the cost of regulation will be limited to adding some pages to existing website. |

|   |        |   |
|---|--------|---|
| Private sector (compliance) costs (lower cost = positive)                     | -      | Assuming that the information requirements will be limited to communicating information that already is available, the costs of compliance needed can be (very) limited.  |
| Private sector investments (arithmetic indicator)                             | o      | The amended regulation does not affect private sector investments.  |
| Public sector spending (lower spending = positive)                            | o      | The amended regulation does not affect public sector spending.  |
| Energy markets contestability (contestability = positive)                     | ++ / + | Implementing the transparency package is expected to have a strong positive effect of the contestability of the energy markets and development of competition which will have a positive effect on economic growth.   |
| Economic growth (growth = positive)   | + / o  |   |
| Energy prices (lower prices = positive)                                       | + / o  | As a result of better functioning energy markets energy prices will be closer to the cost of energy sources.  |
| Environmental impacts   |        | Stakeholders views  |
| Modal shift (sustainable = positive)  | o      | Improved market efficiency probably will not have a significant effect on the use of renewable energy sources.  |
| Emissions (lower emission = positive)   | o      | Lower prices resulting from more efficient energy markets may lead to somewhat lower pressure to reduce energy consumption.   |
| Social impacts  |        | Stakeholders views  |
| Employment (arithmetic indicator)   | o / +  | The improved efficiency of energy markets resulting from the policy package may have a negative effect on employment in the sector. This negative effect is however expected to be more than compensated by employment effects of economic growth in general. |
| Consumer protection (public aid = positive)                                   | o      | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                 | ++ / + | Better market information will foster better planning of allocation of capacities and thus may have a significant positive effect on security of supply.  |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |        |   |

### Actions to regulate long-term contracts in gas

| Summary of economic, environmental and social effects     |       |   |
|---|-------|---|
| Economic impacts  |       | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive)  | -     | In the short term, policy implementation leads to some additional cost (one-time cost). In the long term, cost of regulation increases somewhat due to monitoring of compliance.  |
| Private sector cost of compliance (lower cost = positive) | -     | Differs over the proposed policy actions. Gas release programs pose considerable costs for private companies, while a number of the other proposed policy actions should induce efficiency savings with these private companies.  |
| Private sector investment (arithmetic indicator)          | + / o | Impact of open season procedure on investment level is unknown, while the deletion of deleting Art. 32 and limiting downstream supply contracts has a possible negative impact on the level of infrastructure investments. However, the impact of More transparency on capacity usage might compensate any negative impact. |

|  |       |   |
|--|-------|---|
| Public sector spending (lower spending = positive)                             | o     | The amended regulation does not affect public sector spending.  |
| Energy markets contestability (contestability = positive)                      | +     | Contestability in the gas transmission and gas wholesale and retail markets increases. Higher efficiency of energy market has positive impact on economic growth. Increasing efficiency on the gas transmission market and the gas wholesale and retail market put, ceteris paribus, a downward pressure on prices. |
| Economic growth (growth = positive)  | +     |   |
| Energy prices (lower prices = positive)  | +     |   |
| <b>Environmental impacts</b>   |       | <b>Stakeholders views</b>   |
| Modal shift (sustainable = positive)   | o /   | Higher gas sector efficiency improves the competitive position of gas as fuel input in the electricity sector, and hence, can discourage renewable electricity generation. The impact, however, is expected to be very small.   |
| Emissions (lower emission = positive)  | o     | Higher efficiency on the overall gas market can reduce emissions.   |
| <b>Social impacts</b>  |       | <b>Stakeholders views</b>   |
| Employment (arithmetic indicator)  | + / o | In the long term, a more efficiently functioning gas market will see decrease in gas sector employment. However, through positive impact on economic growth, employment can increase in other sectors.  |
| Consumer protection (public aid = positive)                                    | o     | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                  | + / o | In general, the impact on security of supply (through overall investment) can be neutral or slightly positive. However, this presumes that countermeasures are taken that maintain ability for market parties to hedge investment risks (through long term contracting or other hedging techniques).                |
| ++ = strong positive + = positive o = neutral -= negative -- = strong negative |       |   |

## Access to gas storage facilities

| Summary of economic, environmental and social effects     |       |  |
|---|-------|--|
| Economic impacts  |       | Stakeholders views   |
| Public sector cost of regulation (lower cost = positive)  | - / + | In the short term, policy implementation leads to some additional cost (one-time cost). In the long term, cost of regulation decreases due to less regulatory intervention (structural cost).  |
| Private sector (compliance) costs (lower cost = positive) | 0     | Short-term costs of compliance are moderate. In the long term, the structural cost of complying with overall legislation remains unchanged or will increase somewhat due to increased compliance requirements.   |
| Private sector investments (arithmetic indicator)         | +     | More transparency, market based capacity allocation, secondary market, etc. result in clearer investment signals (decreasing market risk). Hence, positively affects investment.   |
| Public sector spending (lower spending = positive)        | 0/+   | Possibility of increased revenues through selling/auctioning of property rights or leases for depleted gas fields and the like.  |
| Energy markets contestability (contestability = positive) | +     | Contestability in both the gas storage market and the gas  |
| Economic growth (growth = positive)                       | +     | Wholesale market increase. Higher efficiency of energy market has positive impact on economic growth. Further, increasing efficiency on the gas storage market and the gas wholesale market put, ceteris paribus, a downward pressure on prices. In addition, increase in gas storage can reduce price volatility. |
| Energy prices (lower prices = positive)                   | +     |  |

| Environmental impacts   |       | Stakeholders views  |
|---|-------|---|
| Modal shift (sustainable = positive)  | -     | A more competitive gas storage market increases overall gas market efficiency and thus improves the competitive position of gas as the fuel input in electricity generation versus renewable fuels.   |
| Emissions (lower emission = positive)   | o     | Higher efficiency on the overall gas market can reduce emissions. May be compensated by higher emissions due to increase in gas storage activity.   |
| Social impacts  |       | Stakeholders views  |
| Employment (arithmetic indicator)   | o / + | In short term increase in employment due to new storage investment projects. In the long term, a more efficiently functioning gas market will see decrease in gas sector employment. However, through positive impact on economic growth, employment can increase in other sectors. |
| Consumer protection (public aid = positive)                                   | o     | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                 | ++    | Less price volatility due to larger arbitrage opportunities. Increase in gas storage capacity benefits the security of supply level.  |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |       |   |

## Strategic gas stocks

| Summary of economic, environmental and social effects     |   |   |
|---|---|---|
| Economic impacts  |   | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive)  | - | Monitor compliance with obligation  |
| Private sector (compliance) costs (lower cost = positive) | - | Transaction costs (for storage contracts) & development costs (for own storage). Costs vary over the Member States. Costs vary over suppliers (with/without storage, scale, incumbent/new entrant).                                 |
| Private sector investments (arithmetic indicator)         | + | Increase in gas storage investment projects.  |
| Public sector spending (lower spending = positive)        | o | Possibility of increased revenues through selling/auctioning of property rights or leases for depleted gas fields and the like.   |
| Energy markets contestability (contestability = positive) | o | Possibly, specific legislative details can induce an 'uneven playing field' on the gas wholesale market.  |
| Economic growth (growth = positive)                       | - | Small increase in overall energy cost for final consumers can have small impact on rate of economic growth.   |
| Energy prices (lower prices = positive)                   | - | Costs of additional gas storage facilities will be passed on to final consumers. Allocation between type of consumers can differ.   |
| Environmental impacts                                     |   | Stakeholders views  |
| Modal shift (sustainable = positive)                      | + | Additional gas storage facilities increase total gas sector costs, and hence, end-user prices. This decreases the competitive advantage of gas as fuel for electricity generation.  |
| Emissions (lower emission = positive)                     | o | Increase in gas storage activity has small impact on overall level of gas sector energy input. Can partly be compensated by induced electricity generation portfolio shift following the increase in gas price for final consumers. |
| Social impacts  |   | Stakeholders views  |

|   |    |   |
|---|----|---|
| Employment (arithmetic indicator)   | o  | In short term increase in employment due to new storage investment projects. In the long term, a more efficiently functioning gas market will see decrease in gas sector employment. However, through positive impact on economic growth, employment can increase in other sectors. |
| Consumer protection (public aid = positive)                                   | o  | Short term: building of new storage. Long term: more gas storage operations. Any small negative impact on economic growth implies less employment.  |
| Security of supply (secure supply = positive)                                 | ++ | Increase in gas storage capacity benefits the security of supply level.   |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |    |   |

## Changes to the framework for investments in gas import infrastructures

| Summary of economic, environmental and social effects                         |    |   |
|---|----|---|
| Economic impacts  |    | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive)                      | -  | Small increase related to monitoring of compliance and additional coordinating role.  |
| Private sector (compliance) cost (lower cost = positive)                      | +  | Decrease in transaction cost related to regulatory procedures.  |
| Private sector investment (arithmetic indicator)                              | +  | Increase in gas infrastructure investment projects.   |
| Public sector spending (lower spending = positive)                            | o  | Not applicable  |
| Energy markets contestability (contestability = positive)                     | ++ | Potential for increasing competition between different gas infrastructure projects. New infrastructure enhances competition on gas wholesale markets.                                       |
| Economic growth (growth = positive)   | 0  | Small increase in overall energy cost for final consumers has negligible impact on rate of economic growth.   |
| Energy prices (lower prices = positive)                                       | 0  | Costs of new gas infrastructure passed on to final consumers. Possibly, increasing competition on wholesale market can put downward pressure on prices.                                     |
| Environmental impacts   |    | Stakeholders views  |
| Modal shift (sustainable = positive)  | o  | Not applicable  |
| Emissions (lower emission = positive)   | o  | Increase in gas transmission activity has small impact on overall level of gas sector energy input. Can partly be compensated by increased efficiency elsewhere in the gas market.          |
| Social impacts  |    | Stakeholders views  |
| Employment (arithmetic indicator)   | o  | In short term increase in employment due to new infrastructure investment projects. In the long term, a more efficiently functioning gas market will see decrease in gas sector employment. |
| Consumer protection (public aid = positive)                                   | o  | The amended regulation does not affect consumer protection.   |
| Security of supply (secure supply = positive)                                 | ++ | Increase in gas import infrastructure increases the robustness of the EU gas supply system.   |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |    |   |

## DSO unbundling

| Summary of economic, environmental and social effects     |       |  |
|---|-------|--|
| Economic impacts  |       | Stakeholders views   |
| Public sector cost of regulation (lower cost = positive)  | + / o | Strengthening regulator powers will simplify enforcement of compliance with regulation. Moreover withdrawal of the 100.000 threshold will lead to more transparency, simplifying the regulator control. However, the enforcement needs time and capacity of the regulator, and the withdrawal of the 100.000 threshold is an enlargement of the regulator tasks.                     |
| Private sector (compliance) costs (lower cost = positive) | -     | The main reason to exempt DSO's serving less than 100.000 sites was the administrative burden. Reconsidering the threshold will increase the compliance costs. The actual enforcement of the legal unbundling criteria will force all DSO's (serving less than 100.000 customers) to split and restructure, resulting in one-off and structural costs which differ per Member State. |
| Private sector investments (arithmetic indicator)         | +     | Proper unbundling may result in a more independent focus of the DSO management on their own activities, resulting in stronger incentives to perform better. This may increase the investments in the network.  |
| Public sector spending (lower spending = positive)        | + / o | These measures will not influence public spending. It's possible that legal unbundling will lead to the extraction of public money (e.g. municipalities) from the commercial supply activities.  |
| Energy markets contestability (contestability = positive) | +     | The considered actions will probably improve the contestability of the energy markets resulting in enhanced competition and, ceteris paribus, better (price) offerings for clients.  |
| Economic growth (growth = positive)                       | +     |  |
| Energy prices (lower prices = positive)                   | +     |  |
| Environmental impacts                                     |       | Stakeholders views   |
| Modal shift (sustainable = positive)                      | o     | We do not expect that these measures will influence the modal shift, although improved TPA may improve the market position of sustainable generators.  |
| Emissions (lower emission = positive)                     | o /   | Lower energy prices resulting from more efficient energy markets may lead to lower pressure to reduce energy consumption. However, other costs (oil, taxes) will influence this pattern.   |
| Social impacts  |       | Stakeholders views   |
| Employment (arithmetic indicator)                         | + / o | Due to consolidation and increased competitiveness employment on the internal energy markets may decrease. However, this effect is coherent to the desired competitive markets, forcing companies to work more efficient. This negative impact on the employment probably will be overcompensated by the positive effects of better energy offerings.                                |
| Consumer protection (public aid = positive)               | + / o | Increased contestability of energy markets will have a positive effect on the position of consumers (e.g. improved TPA and easy switching procedures).   |
| Security of supply (secure supply = positive)             | o     | We do not expect that these measures will influence the security of supply.  |

++ = strong positive + = positive o = neutral -= negative --= strong negative

## Further measures on consumer issues and energy poverty

| Summary of economic, environmental and social effects     |    |   |
|---|----|---|
| Economic impacts  |    | Stakeholders views  |
| Public sector cost of regulation (lower cost = positive)  | -  | The modifications to the regulatory arrangements enclose the obligation to provide websites with (information about) comparable prices, protection to unfair selling practices and switching procedures. Beside that, the regulators need to develop these switching procedures. These activities need of course time and capacity of the regulator, although we expect these costs to be rather low. Actual interference (if desired) will increase regulator costs in the short run. We do not expect that smart metering and protection of vulnerable customers will influence the cost of regulation.   |
| Private sector (compliance) costs (lower cost = positive) | +  | The protection of vulnerable customers may lead to private sector compliance costs, although that depends on the legislative details. In most Member States the energy companies must present their prices to the NRA's. Therefore, we expect that the obligation for NRA's to provide price information does not result in large additional costs for the private sector. Smart metering may increase the costs for feedback to the households due to the fact that the frequency is raised. On the other hand, the information available on the regulator website may decrease the (transaction) costs for searching information. Better switching procedures may decrease transaction costs. |
| Private sector investments                                | ++ | Enhancing smart metering to every customer will increase  |
| (arithmetic indicator)                                    |    | the private sector investments increasingly (meters, data infrastructure, feedback infrastructure). In principle, the consumers and society as a whole will benefit from these investments. It depends on the chosen financing structure (higher prices, subsidies, etc.) whether the industry can gain back these investments.   |
| Public sector spending                                    | -  | The same is true for the public spending. The commercial  |
| (lower spending = positive)                               |    | Business case for smart metering seems not to be valid. Therefore, (large) public investments need to be taken into consideration. Better protection of vulnerable customers will increase social costs, although that depends on the legislative details.  |
| Economic impacts  |    | Stakeholders views  |
| Energy markets contestability (contestability = positive) | +  | Providing all this information on the regulator website may strengthen the position of the household consumer. He will be able to gain comparable information about prices and knows how to protect himself against mis-selling. Beside that he may benefit from the easy switching procedures. Introduction of smart metering will lower the information asymmetry, because the consumer has the possibility to obtain up-to-date information about his consumption pattern.   |
| Economic growth (growth = positive)                       | +  | Strengthening of the consumer's position will contribute to the competitiveness of the internal energy market, what will be beneficial for the economic growth of Europe. The increased contestability and competition on the energy markets will, ceteris paribus, probably lead to a decreasing effect on the energy (retail) prices, although the regulator policy regarding the tariffs will be essential here.   |
| Energy prices (lower prices = positive)                   | +  |   |
| Environmental impacts                                     |    | Stakeholders views  |
| Modal shift (sustainable = positive)                      | o  | These measures will not have a large impact on the modal shift, although the awareness of consumption patterns (smart meters) may increase the use of sustainable energy sources and improved switching procedures may result in higher switching to sustainable energy.  |
| Emissions (lower emission = positive)                     | o  | Lower energy prices may lead to extra consumption of energy, although other costs (oil, taxes) will influence this pattern. However, some argue that smart metering will influence the energy consumption and will reduce CO2 emission.   |
| Social impacts  |    | Stakeholders views  |

|   |    |  |
|---|----|--|
| Employment (arithmetic indicator)   | o  | These measures should not have large impact on employment. Due to consolidation and increased competitiveness employment on the internal energy markets may decrease. However, this effect is coherent to the desired competitive markets, forcing companies to work more efficient. This negative impact on the employment will be exceeded by the positive impact the better functioning markets may have on other markets and the trans-European competitive position of European economies. Pertaining to smart metering, the roll out of the meters may increase employability in the short run, and decrease in the long run (efficient smart metering using telecommunications instead of employees). |
| Consumer protection (public aid = positive)                                   | ++ | These measures will definitely contribute to the consumer protection. Customer can obtain more information, e.g. on protection against unfair selling practices, prices and consumption pattern. Beside that, vulnerable customers will be better protected.   |
| Security of supply (secure supply = positive)                                 | o  | We do not expect that these measures will influence the security of supply.  |
| ++ = strong positive + = positive o = neutral -= negative --= strong negative |    |  |



## Annex VI: Credit ratings of large European energy companies (S&P ratings)

|   | 18.6.<br>2007 | 1.1.<br>2007 | 1.1.<br>2006 | 1.1.<br>2005 | 1.1.<br>2004 | 1.1.<br>2003 | 1.1.<br>2002 | 1.1.<br>2001 | 1.1.<br>2000 |
|---|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>ownership unbundled TSOs</b>               |               |              |              |              |              |              |              |              |              |
| <b>Enagas</b>                                 | AA-           | AA-          | AA-          | AA-          | A+           | A+           | NR           | NR           | NR           |
| <b>N.V. Nederlandse Gasunie</b>               | AA+           | AA+          | AA+          | NR           | NR           | NR           | NR           | NR           | NR           |
| <b>National Grid PLC</b>                      | A             | A            | A            | A            | A            | A            | A            | NR           | NR           |
| <b>Terna SpA</b>                              | AA-           | AA-          | AA-          | AA-          | NR           | NR           | NR           | NR           | NR           |
| <b>Red Eléctrica de Espana (REE)</b>          | AA-           | AA-          | AA-          | AA-          | AA-          | AA-          | AA-          | AA-          | NR           |
| <b>companies without transmission network</b> |               |              |              |              |              |              |              |              |              |
| <b>Centrica PLC</b>                           | A             | A            | A            | A            | A            | A            | A            | A            | A            |
| <b>Endesa S.A.</b>                            | A             | A            | A            | A            | A            | A            | A            | A+           | A+           |
| <b>Enel Spa</b>                               | A             | A+           | A+           | A+           | A+           | A+           | A+           | A+           | NR           |
| <b>Energias de Portugal S.A.</b>              | A             | A            | A            | A            | A            | A+           | AA-          | AA           | AA           |
| <b>ESSENT N.V.</b>                            | A+            | A+           | A+           | A+           | A+           | A+           | A+           | NR           | NR           |
| <b>Gas Natural</b>                            | A+            | A+           | A+           | A+           | A+           | A+           | A+           | AA-          | AA-          |
| <b>Iberdrola S.A.</b>                         | A             | A            | A+           | A+           | A+           | A+           | A+           | AA-          | AA-          |
| <b>Union Fenosa SA</b>                        | BBB+          | BBB+         | BBB+         | BBB+         | BBB+         | BBB+         | A            | A+           | NR           |
| <b>vertically integrated companies</b>        |               |              |              |              |              |              |              |              |              |
| <b>EDF S.A.</b>                               | AA-           | AA-          | AA-          | AA-          | AA-          | AA           | AA+          | AA+          | AA+          |
| <b>EnBW AG</b>                                | A-            | A-           | A-           | A-           | A            | A+           | A+           | A+           | NR           |
| <b>E.ON AG</b>                                | A/A-<br>1     | AA-          | AA-          | AA-          | AA-          | AA-          | AA           | AA           | AA           |
| <b>Gaz de France SA</b>                       | AA-           | AA-          | AA-          | AA           | AA           | AAA          | AAA          | AAA          | AAA          |
| <b>Public Power Corp. SA (Greece)</b>         | BBB+          | BBB+         | BBB+         | BBB+         | BBB+         | BBB+         | BBB+         | BBB+         | BBB+         |
| <b>RWE AG</b>                                 | A+            | A+           | A+           | A+           | A+           | A+           | AA-          | AA-          | NR           |
| <b>Scottish Power</b>                         | A-            | A-           | A-           | A-           | A-           | A-           | A-           | A            | A            |
| <b>Scottish &amp; Southern Energy</b>         | A+            | A+           | A+           | AA-          | AA-          | AA-          | AA-          | A+           | A+           |
| <b>Vattenfall AB</b>                          | A-            | A-           | A-           | A-           | A-           | A-           | A-           | A+           | AA-          |

Sources: Standard & Poor's, except for Rede Eléctrica Nacional (REN) rated by Companhia Portuguesa de Rating, S.A.; NR = not rated

Annex VII: Electricity price evolution in EU-27 for the period 1998-2006 according to ownership structure of TSO

|               | <b>Electricity prices</b>                          |                               |   |                               |
|---------------|--|-------------------------------|---|-------------------------------|
|               | <b>Industry</b><br>(Annual consumption:<br>30 MWh) |                               | <b>Households</b><br>(Annual consumption:<br>600 kWh) |                               |
|               | MS with<br>ownership<br>unbundling                 | MS with<br>integrated<br>TSOs | MS with<br>ownership<br>unbundling                    | MS with<br>integrated<br>TSOs |
| 1998 1st half | 100,00   | 100,00                        | 100,00  | 100,00                        |
| 1998 2nd half | 97,38  | 98,88                         | 99,75   | 99,68                         |
| 1999 1st half | 92,88  | 99,25                         | 93,72   | 101,51                        |
| 1999 2nd half | 92,18  | 97,60                         | 92,17   | 101,57                        |
| 2000 1st half | 88,77  | 97,59                         | 94,98   | 102,02                        |
| 2000 2nd half | 88,71  | 94,56                         | 93,77   | 101,73                        |
| 2001 1st half | 85,69  | 93,92                         | 92,59   | 103,00                        |
| 2001 2nd half | 85,59  | 95,79                         | 95,05   | 101,78                        |
| 2002 1st half | 74,76  | 96,28                         | 97,54   | 110,12                        |
| 2002 2nd half | 73,01  | 93,60                         | 93,52   | 109,66                        |
| 2003 1st half | 79,86  | 99,36                         | 93,91   | 114,80                        |
| 2003 2nd half | 73,82  | 101,59                        | 93,97   | 112,70                        |
| 2004 1st half | 81,00  | 101,85                        | 94,32   | 113,84                        |
| 2004 2nd half | 79,25  | 106,23                        | 92,64   | 115,55                        |
| 2005 1st half | 83,78  | 104,86                        | 96,10   | 122,31                        |
| 2005 2nd half | 85,47  | 106,41                        | 96,28   | 124,49                        |
| 2006 1st half | 93,63  | 111,92                        | 103,23  | 128,29                        |
| 2006 2nd half | 96,99  | 106,01                        | 105,91  | 129,46                        |

Source: Eurostat, own calculations

### Annex VIII Participations of 3<sup>rd</sup> country investors in EU gas infrastructure

Gazprom does not own a majority stake in any of the European transmission system operators. However, it has important shares in several of them:

| <u>Gazprom shareholdings in European transmission system operators</u> |        |   |
|--|--------|---|
| Eesti Gas (Estonia)  | 37.2%  | Integrated group with a TSO subsidiary          |
| Europolgaz (Poland)  | 48%    | TSO   |
| Gasum (Finland)  | 25%    | Integrated group with a TSO subsidiary          |
| Interconnector (UK-BE)   | 10%    | TSO   |
| Latvijas Gaze (Latvia)   | 34%    | Integrated group with a TSO subsidiary          |
| Lietuvos Dujos (Lithuania)   | 37.1%  | Integrated group with a TSO subsidiary          |
| Wingas (Germany)   | 49.99% | Integrated group with a TSO subsidiary          |
| VNG (Germany)  | 5.26%  | Integrated group with a TSO subsidiary (ONTRAS) |

Moreover, the state-owned International Petroleum Investment Company (IPIC) of Abu Dhabi holds a minority share in OMV and plans to invest in the Nabucco pipeline, Norwegian Statoil holds a minority participation in Swedegas and institutional investors hold important participations in particular in National Grid and Enagas. In fact, international infrastructure investment funds and pension funds have signaled their interest to acquire more participations in EU networks.