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TO THE EUROPEAN PARLIAMENT AND THE COUNCIL**

Energy Infrastructure and Security of Supply

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1. KEY POLICY OBJECTIVES FOR THE ELECTRICITY AND GAS INDUSTRY IN EUROPE

Europe needs an energy industry that is dependable, in terms of security and continuity of supply; sustainable, in terms of its environmental performance; and competitive, delivering an efficient service to households and business and thus contributing to the competitiveness of the European Economy and the quality of life of its citizens.

In respect to the final objective, the organisation of the energy sector in the European Union is already undergoing fundamental change. The first electricity and gas Directives¹ have already abolished the principle of a monopoly provider and allowed large users to choose their electricity and gas supplier. Many Member States responded to this initiative by moving quickly to establish a fully competitive market. With the entry into force of the new gas and electricity Directives², all Member States will, in 2004, extend competition to non-households with the final step to full market opening by 2007 at the latest.

The internal market, moreover, needs to contribute to the underlying objective of sustainable competition. This, above all, relates to the EU's environmental commitments to control the emission of greenhouse and other gases. Specifically, in the Kyoto Protocol, the EU committed itself to reducing its emissions of the six Kyoto gases by 8% below their 1990 level by 2008-2012. In order to comply with the Kyoto Protocol, more stringent measures and policies from Member States are of utmost importance. This includes the initiative to reduce emissions from the power sector, to constrain growth in demand through energy efficiency and to introduce common rules for the taxation of energy products.

Finally, it must be ensured that the internal energy market develops in a manner that provides the highest possible standards of security of supply for European citizens and industry. This has two elements; system security, and ensuring adequate supplies of gas and electricity in both the medium and the long term.

2. WHAT MEASURES ARE REQUIRED TO DELIVER A SECURE, SUSTAINABLE AND COMPETITIVE ENERGY SECTOR

The question of the measures required to achieve the Community's energy objectives have already been examined by the Commission in previous Communications. In particular, the Green Paper of the Commission on Security of Supply³ drew attention to a number of key considerations for the energy industry over the next 20-30 years. A key feature is the EU's increasing dependence on imported energy, the growing importance of natural gas as a supply source, and the level of investment needed in infrastructure. The debate launched by the Green Paper also underlined the need for a strategy based on demand management and of the desirability of competitive markets and effective competition, reinforcing the competitiveness of the European economy and implying a better use of existing cross-border capacities. Responses to the Green Paper of the Commission on Security of Supply have made a key contribution to the formation of the Commission's energy strategy and the associated package

¹ 96/92/EC and 98/30/EC

² 2003/54 and 55 and Regulation 1228/2003

³ COM(2000) 769 final, 29 November 2000

of measures⁴ following the Green Paper. For example, the Commission proposal on coordinated measures on the security of energy supplies⁵ was adopted on 11 September 2002 addressing oil and gas stocks.

Likewise, the Commission's Infrastructure Communication of December 2001⁶ was the first examination of the crucial role of such investments to support the development of the internal market. The Barcelona Summit in March 2002 welcomed this document and, in particular, endorsed the target for Member States to have a level of electricity interconnection equivalent to at least 10% of their installed production capacity by 2005⁷. The 13 proposed actions in the first communication are in the process of being completed, or have already been achieved⁸. As well as the adoption of the new Directives and Regulation, which was achieved in July 2003, other completed actions include an agreement on the removal of charges on cross border electricity exchanges, publication of cross border gas capacity and an initial revision of the Trans European Energy guidelines adopted in June 2003. Other actions, such as the implementation of the agreed congestion management guidelines are still ongoing and will be completed in the context of the new Directives, and the Regulation on Cross Border Electricity Exchanges.

The Commission also recently released a Communication examining the development of energy policy for the enlarged European Union, its neighbors and partner countries⁹. This paper discussed issues relating to extending the internal market for electricity and gas to neighboring countries and securing gas supplies for the European Union.

This wide ranging consultation has shown the need for further measures at Community level are now necessary, in particular, to provide a stable framework to encourage investment. This relates to all the objectives of the Community, whether to do with security of supply, sustainability or the internal market. These measures can be summarised as follows.

Firstly, following the introduction of the competitive market, there is a clear need for a regulatory framework for the wholesale electricity market which ensures the continuing balance between supply and demand, including both demand management and the required levels of investment in electricity generation, by encouraging their response to the price signals in the market. In this context, measures to manage demand expansion must be at the heart of the Community's approach in this field. Managing demand is both cheaper and works more quickly than, for example, efforts to continuously increase generation capacity on the basis of extrapolations from the current situation. However some new investment will be needed simply to renew plant that has reached the end of its life. Much of this investment is expected to take the form of renewables and distributed small scale CHP generation. Security of supply also requires that investment in internal EU transmission networks and in long distance gas transport must also be maintained. This requires, above all, a stable and consistent regulatory framework and streamlined procedures for the approval of new projects.

⁴ See the follow up Communication "Final report on the Green Paper "Towards a European strategy for the security of energy supply" COM(2002) 321, Brussels, 26.6.2002. The Green Paper website can be found at: http://europa.eu.int/comm/energy_transport/en/lpi_lv_en1.html

⁵ COM(2002) 488 final

⁶ COM(2001) 775

⁷ Presidency Conclusions, Barcelona European Council 15-16 March 2002, page 15, 16/3/2002 Nr: 100/1/02

⁸ See Annex 1 for details.

⁹ COM(2003) 262 final: 26 May 2003

Secondly, with respect to the environmental targets of the European Union, there are also new challenges relating to infrastructure. To reach the targets relating to, for example, renewables, a range of measures is being used; including fiscal and other economic measures, to improve efficiency of plant, reduce emissions, increase the use of renewable energies and manage demand. However, adequate energy infrastructure is also a key requirement regarding the implementation of many of these measures. This is especially true for the connection of wind farms now being located in off-shore sites and for distributed generation. There therefore exists a direct need to make the appropriate reinforcements in transport and distribution capacity to support renewable and low emission technologies. Without new infrastructure some renewable energy will not be able to have the required impact on supply of the internal market. In this context, it should be pointed out that significant support also needs to be given to the very promising development of hydrogen, which as a future energy carrier could contribute significantly to security of supply, the reduction of greenhouse gases and the improvement of the local environment.

Finally, without more interconnection between Member States and for gas, better use of the existing infrastructure, the functioning of competition in the internal market will be constrained. For example, in a number of EU countries, a trend has emerged at national level, not to create effective competition, but to reduce competition through mergers, both horizontal and vertical. This tendency towards consolidation has not been accompanied by the necessary measures to ensure that the markets concerned have become fully integrated into the wider European market by constructing additional interconnector capacity. Unless this happens, customers will remain captive in practice, even if they theoretically have a choice between suppliers. Thus, a greater level of interconnection between Member States is instrumental to the development of a competitive internal market, which is a priority for the European Union. Incidentally, given the importance of constructing new electricity interconnectors, it is of particular concern that inadequate progress is being made in achieving the 10 % interconnection target. There is also recognition that even this target might be too low in some Member States or regions of the Community where the very high market shares held by one or very few companies signal the existence of barriers to entry in the domestic generation market.

With the accession of ten new Member States and the ongoing development of the EU energy relationships with neighbouring countries, the need for a stable regulatory framework that supports the necessary investment is now a high priority for the Community.

3. MEASURES NECESSARY IN THE ELECTRICITY SECTOR

3.1 Introduction

A successful electricity industry must deliver a continuous equilibrium between supply and demand of electricity while also allowing for competition between different generators and suppliers. In addition to the market opening measures already in force appropriate incentives to invest in both transmission and distribution networks as well as for demand management and/or electricity generation are central to these objectives. Without such investments the reforms of the electricity sector will not succeed and there will be an ever increasing risk of interruptions if demand for electricity continues to grow at its current rate and the strain on the network increases.

3.2 System security and reliability

Despite the various interruptions to supply that occurred during 2003 it would appear, in general, that the European electricity system does not have the same level of systematic failings that exist in the US. In particular there exists a clearer allocation of responsibilities, there is greater integration in terms of organisation and regulation and a higher level of cooperation between network operators. There is also a greater emphasis on the management of demand for electricity which reduces the likelihood of such incidents. However, the key lessons to be drawn from such incidents that are particularly relevant for the European Union are that.

- Co-ordination between transmission system operators of different Member States and neighbouring countries must be enhanced. A lack of co-ordination was a key factor in both the black out in Italy in September 2003 and the incident in the north Eastern USA.
- The question of the supply demand balance cannot be neglected. Although there were no blackouts due to supply-demand issues, extreme weather conditions in both the winter and summer did lead to some emergency measures being taken. In this context, it is clear that demand growth must be controlled since this is the underlying cause of the increased stress of the existing network.
- Sufficient transmission capacity is also a necessary component of security of supply.

These three factors for a secure supply of electricity are discussed in the sections below in more detail. However it is worth noting that although there is some attention to these pre-occupations at Member State level, this has been sporadic and inconsistent and if no further action is taken the risk exists that the problems that have been experienced might become more frequent within the European Union. The dislocation caused by the various incidents during 2003 within the EU is an indication of the impact of such events.

3.2.1 *Security and Reliability Rules at EU Level*

The introduction of competition, particularly across national borders, brings new demands on the transmission network. The increase in the quantity of cross border transactions and the less predictable flows that tend to result mean that it is crucial that not only the infrastructure itself, but also the rules and mechanisms for controlling such flows, are adequate.

To this end, the Union of Co-ordination of Transmission of Electricity (UCTE) at the request of the “Florence” Electricity Regulation Forum, has initiated the work on Operational Handbook which aims at binding security and reliability rules in the UCTE network. This work serves mainly to consolidate existing agreements between system operators which have been in place for a number of years. Although similar systems are in place in the US, they do not appear to have been implemented in the recent incident. This strengthens the case for binding security standards where the principles of reciprocity are respected and enforced.

The Commission, European regulators, the TSOs outside the UCTE area, and other stakeholders have also participated in this work. The Regulation on cross-border trade of electricity provides for the possibility to include, in the guidelines on congestion management, common rules on minimum safety and operational standards for the use and operation of the network. It is the intention of the Commission that the future guidelines will include basic

rules of this type in support of the development of the Handbook. In addition, however, it is essential that Member States ensure that the TSOs comply with the detailed guidelines.

3.2.2 Supply Demand Balance

Imbalances between demand and supply can cause major disturbances. In particular, even a minor imbalance may lead to a general interruption caused by failure of individual transmission line which spreads to other parts of the network. Such events are normally the result of an absence of sufficient reserve generation capacity, which is needed to serve peak demand and/or needs to cover outages and maintenance. In some countries and regions the need for either new capacity or demand constraints are already evident. Insufficient generation was a major contribution to the California electricity crisis (even if not the only one). Similarly, Nordic countries were obliged to look for crisis measures in cold weather periods in winter 2002/2003, as dry weather caused historically low reservoir levels. In order to avoid more serious incidents, Member States need to have a clear policy in place, both on the demand side and the supply side.

The contribution to be made by demand management

One key lesson from these events, as already established in the Commission's Green Paper on Security of Supply, is that measures to control demand are a crucial component of any Member State's security of supply policy. It is clear that a significant reduction in demand could be made through relatively simple efforts to avoid unnecessary consumption of energy. What is more, such measures are usually faster to implement than the alternatives. For example, It is estimated today that the average cost in many Member States of saving a unit of (off-peak) electricity in the domestic sector is around 2.6 euro cents /kWh, compared to the average (off-peak) price for delivered electricity of 3.9 euro cents. Overall, total final energy consumption in the EU is approximately 20%¹⁰ higher than can be justified on purely economic grounds. Many case studies on projects in different Member States show that typical energy performance projects often have a potential savings of 15-35%.

Without reducing comfort or standards of living, it is therefore possible to reduce energy consumption by at least one-fifth at no extra net cost –and in many cases negative costs– because the saved energy is sufficiently valuable to repay the cost of investment in a reasonable length of time – well within the technical lifetime of the investment – and to cover interest charges. Today this savings, were it to be calculated in terms of primary consumption, would correspond to over 8, 400 PJ/year, or 200 million tonnes of oil per year.

The realisation of such savings would provide an alleviation of potential supply demand imbalances over the next few years. Demand management would prevent the need for expensive investments in new generation capacity and would contribute to the Commission's commitment to reduce greenhouse emissions. The introduction of appropriate incentives to manage demand should be the first port of call for any Member State with concerns about security of supply. It is for this reason that the Commission intends to put forward a specific proposal for a Directive on the provision of energy efficiency and energy services relating to demand management. In addition to improving the security of supply for the electricity sector, this proposal will also contribute to improving the security of supply in other important energy sectors, including gas and heating and transport fuels.

¹⁰ MURE model estimation based on current energy prices. European Commission, 2003.

A stable framework for investment

Another consideration is that much obsolete and environmentally damaging existing plant will be closed thanks to the implementation of the Large Combustion Plant Directive over the next few years. This measure will do much to create a fair competitive and sustainable market in the medium term. A number of policies are already in place to promote investments in less carbon intensive technologies. For example the renewables Directive and the proposals for a Directive on electricity from cogeneration will already provide a significant impetus to these forms of new generation and will lead to significant investments. However, some new investment in conventional generation is also inevitable.

In general, provided the appropriate price signals exist in the form of a transparent wholesale electricity price, the market should be able to guarantee the necessary response on a purely competitive basis. Specifically, as the supply-demand position deteriorates, prices will increasingly be set by more expensive generation units. As this occurs, either consumption will be reduced, or investment in new generation capacity will become viable and the situation will rectify itself. This is, broadly speaking, the same process as in other sectors of the economy.

However, there are concerns about whether this process will function in a sufficiently effective way in the electricity market. Firstly, electricity markets are characterised by both inelastic supply and demand and wholesale prices tend to be volatile. This is exacerbated by the current design of the electricity markets: on the demand side, most consumers do not participate actively in the price-setting process; therefore, they behave as if they were insulated from the effects of higher prices on the spot market for electricity. Demand, at least over the short term, is relatively inelastic, since most consumers lack both the incentives and the means to reduce peak demand. However, the provision of demand response mechanisms can enhance price responsiveness. For the supply side, although prices in wholesale markets will occasionally need to rise significantly above the cost recovery level in order to attract the necessary new investments¹¹, there are concerns that new investments may not respond sufficiently quickly to higher prices that these might thus last for a long time and have a negative impact on the economy. A second concern is that the market may never deliver sufficient capacity to cope with the very highest episodes of peak demand, as the uncertainty that exists as to the frequency and timing of such events, together with the prospect that regulators might cap the market price for this peak supply, make the expected rate of return of these investments extremely low and uncertain.

Several EU member states are currently studying whether any other specific measures should be implemented, either to encourage general investments to occur more quickly, to encourage a faster demand response to emerging imbalances or in order to guarantee a sufficient reserve capacity in electricity production to cover peaks in demand. The electricity directive already obliged Member States to monitor the supply demand position and to provide an option to use tendering in order to acquire new capacity. Greece and Ireland have already made use of this possibility. Tendering should, however, be seen as an absolute last resort given the numerous distortive effects that such a measure can have on the market and the bias that this produces in favour of purely supply side measures. In particular, the existence of the possibility to tender

¹¹ Prices in electricity markets are normally be set by the marginal cost of the highest cost plant that successfully offers its production into the market. In periods of surplus generation capacity this is normally well below the cost recovery level for a new investment meaning, specifically; the capital costs of new plant will not be covered.

will tend to constrain independent investment decisions being made spontaneously. Other Member States have experimented with some more general form of incentive to generation such as availability payments or compulsory reserve margins. A correct balance is needed and the ideal solution is likely to be different in each Member State. For example, hydro-based systems differ considerably in this respect from thermal based systems.

Great care is required with any intervention. If such policies are poorly designed, they can be counter-productive and make the original problem of the functioning of the market even worse. What is clear, however, is that Member States must, either individually or collectively, have a clear and unambiguous approach to the wholesale electricity market. Without this the regulatory risks to investors will be unacceptable.

3.2.3 Adequate transmission infrastructure

In the context of the single market, interconnector investments are crucial to secure both the commercial capacity and the security of the network. Of particular importance are measures to reinforce transmission networks to respond to the changing pattern of flows in the network that result from the introduction of the internal market; as well as the growth in renewable energy and other distributed generation. Control of these critical energy infrastructures is, in turn, highly dependent on the security and reliability of the monitoring and controlling ICT infrastructures. The emerging consensus is that transmission investments need to have a high degree of central co-ordination in order to deliver a rational network and reduce uncertainty. There are a number of reasons for this.

Firstly the transmission network of much of the European Union is a single integrated system. Adding a new element has an influence on the whole of the network. All transmission system operators affected by the investment therefore need to be aware of the positive and negative consequences of the network changes. Transmission planning is also necessary to reduce uncertainty for potential investors in generation capacity. For example, generators need to know about future transmission investments which could possibly enable competitive imports from a lower price area.

There are a number of reasons why the necessary transmission investments are not progressing which are discussed in more detail in Annex 2 below. This includes several projects that the European Council has already identified and agreed as projects of priority European interest. This situation is not sustainable given the investment needs of the European Union in this sector.

3.2.4 Conclusions

The inter-related questions of system reliability, energy market design, generation adequacy and transmission investment and to the priority given to managing energy demand are all relevant to the objective of overall security of supply.

Despite the work undertaken to date since the start of market opening, it is not always the case that Member States have a clearly set out overall policy with defined standards on all of these questions. It is, therefore, the view of the Commission that this aspect of energy policy needs to be further clarified.

3.3 Reaping the full benefits of the internal market

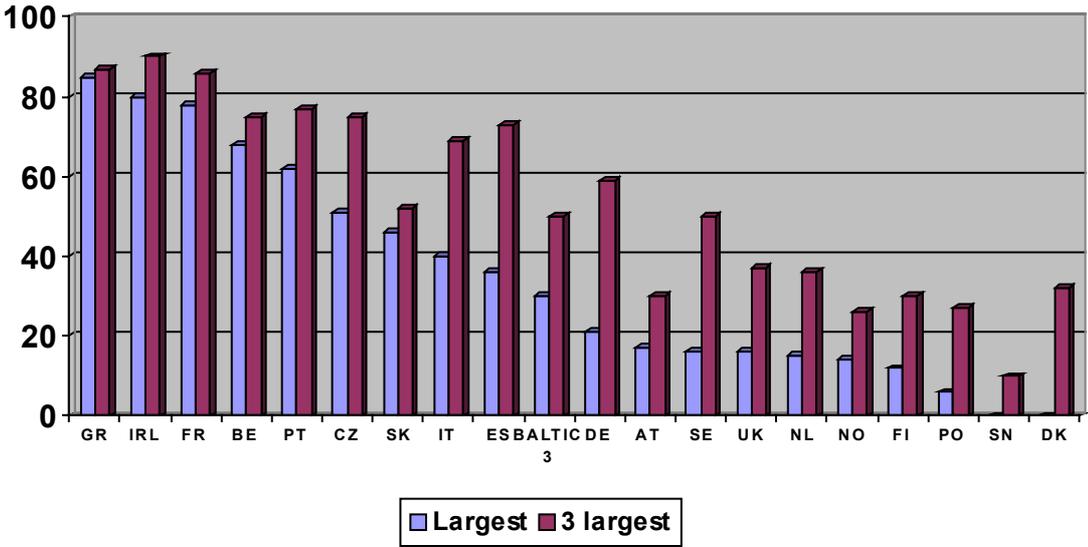
The new electricity and gas directives set clear dates for the full market opening with all non-household customers being eligible already in July 2004. Many Member States have already

anticipated these requirements and already have the possibility for all customers to choose their supplier. However, for electricity in particular, the lack of cross border capacity is a particular problem for the functioning of the single market. It is therefore regrettable that the target set following the first Communication on Energy Infrastructure, that the level of interconnection should be equivalent to 10% of installed generation capacity, has not yet been met in all Member States.

Furthermore it is clear that even this level of interconnection will not be sufficient to support the internal market where relevant barriers to entry in the domestic market still persist. In this event, the entry of suppliers from other Member States is the only realistic way for competition to develop rapidly. The Commission’s benchmarking exercises¹² have clearly demonstrated this problem. There are several markets where the conditions are far from optimal in this respect.

The graph below shows the degree of concentration in each generation market, in terms of the share of the largest, and the three largest companies. This figure has then been adjusted (i.e. lowered) by taking into account the amount of import capacity, recognising that this is also a source of competition.¹³

Graph 1 Concentration in the electricity generation market



This analysis clearly shows an unsatisfactory position in a number of the 25 Member States with the following striking examples:

- Greece, where the “Public Power Company” (PPC) controls the domestic generation market and connection with Balkan neighbours is not well developed,
- Ireland, where Electricity Supply Board’s (ESB) position continues to be isolated from potential competitive pressures and where there is insufficient interconnection with Northern Ireland and the wider EU market,

¹² SEC(2003) 448, European Commission, 4 April 2003
¹³ Published NTC Summer 2003: source ETSO.

- France, where Electricité de France’s (EDF) position can only be challenged to a limited extent through imports,
- Belgium, where the dominant position of Electrabel is compounded by insufficient import capacity,
- A number of the new Member States (e.g Czech Republic, Slovakia), where transmission grids need to be reinforced and/or further upgraded to allow competition between former incumbents,
- Austria, where reinforcement of the national network is needed to ensure sufficient cross border competition with the newly merged “Energie Austria”,
- Italy where reinforcement of connections with neighbouring countries, especially, Austria and Slovenia would increase reliability and provide greater diversity,
- Finally, in Spain and Portugal, the slow progress in developing interconnectors and the completion of an integrated market still means that the largest companies retain a significant degree of control.

These concerns have been confirmed by a recent survey of large consumers in the electricity and gas markets which covered, in particular, Belgium, Italy, Germany, Austria and Finland. On aggregate, **45%** of the total respondents were dissatisfied with the development of competition in the electricity market¹⁴ and **around 80%** of these cited the low availability of import capacity, or the existence of a dominant player, as a significant problem. The market conditions prevailing in these Member States are reasonably reflective of the EU as a whole and the companies covered make a key contribution to European competitiveness.

As well as new investment, other actions can also contribute to a suitable market structure for the electricity industry. Measures such as divestment and capacity release through “virtual power plant” auctions have already been undertaken sporadically in the EU with some success. Ideally a combination of an extension and intensification of these measures combined with suitable investment in cross border transmission capacity is required. Overall, it would seem that the lower the level of investment by Member States in new interconnections, the greater the need for measures such as capacity release or divestment are necessary to ensure that the electricity market can function. Or, put another way, if the problems due to lack of interconnector capacity are more quickly resolved, more interventionist measures may not be necessary. For example, measures such as end-user price controls, which restrict the benefits of a competitive market and should be seen as a temporary measure during the initial stages of the market opening process, could be removed more rapidly if a more satisfactory market structure were in place. One thing is clear: **a policy of no action would deprive consumers of the benefits of competitive electricity prices and needlessly damage the overall performance of the European economy.**

The prime responsibility for addressing many of these issues lies at national, not Community level, pursuant to the subsidiarity principle. It is only Member States, at present, which have the authority to authorise new interconnectors or to increase the level of competition through other measures. By contrast, the Commission does not have such powers. It cannot, for example, order capacity release or divestment schemes, except possibly as a remedy under

¹⁴ 2 or less on a scale of 1 to 5

competition law during a decision on a concentration. Neither can it currently take the measures which would directly lead to the construction of new interconnectors. However, there are a number of supporting actions that could be taken at European level.

3.4 Concrete Actions Proposed

The sections above highlight the main improvements that need to be made to the structure of electricity market in the European Union to ensure both a functioning competitive market and a reliable and efficient supply. These relate, in the main, for improved system operation, the need to support appropriate investments in transmission and to ensure an ongoing balance between supply and demand. The Commission therefore proposes a Community framework in this subject which will ensure these objectives are met with the minimum distortion to the internal market through the following measures, for which proposals are attached to this Communication.

ACTION 1 a **Directive concerning the energy end-use efficiency and energy services** which will:

- remove barriers to the provision of energy services and energy efficiency measures;
- adopt **national targets** of an annual amount of energy to be saved that is equal to 1% of an average of previous years' final consumption in order to promote energy end-use efficiency;
- ensure that retail suppliers and/or distributors of electricity, natural gas, fuel (heating) oil, and district heating co-operate and participate actively in the energy services market and that they ensure that energy services are offered to customers and promoted;
- appoint a body or agency that will oversee the savings obligations, the energy services obligation and the task of monitoring and verifying the fulfilment of these obligations;
- allow for publicly overseen financing possibilities for energy end-use efficiency, especially for investments with comparatively long payback requirements or high transaction costs;
- ensure that the public sector in each Member State sets a good example regarding investments, maintenance and other expenditures for energy-using equipment, energy services and other energy efficiency measures. To accomplish this, Member States shall adopt a **target**, expressed in terms of an annual improvement of total energy efficiency in the public sector of a cumulative 1½ % per year, attributable to the implementation of energy services, energy efficiency programmes and other energy efficiency measures in the public sector;
- require Member State regulators or their equivalent bodies for energy distribution and retail sales of grid-bound energy to take measures for the introduction of innovative tariffs, cost recovery regulations, revenue caps and similar instruments and obligations to promote energy services, energy efficiency programmes and other energy efficiency measures;

- establish energy efficiency programmes that promote and facilitate the provision of energy services and energy efficiency measures such as energy auditing, energy and tariff advice provision, the provision of financial instruments for energy savings, etc;
- ensure that end-users are provided with competitively priced individual metering and informative billing that reflect their actual energy consumption and, as nearly as possible and when appropriate, its actual time of use.

ACTION 2 a **Directive on Electricity Infrastructure and Security of Supply** which will:

- require Member States to have a clearly defined policy towards the supply-demand balance which allows for targets for reserve capacity to be set or measures including demand side measures ;
- require Member States to have defined standards to be met relating to the security of the transmission and distribution networks;
- require that each Transmission System Operator submits an (multi)annual investment strategy to its national regulator; ;
- require regulators to submit a summary of these investment programmes to the Commission for consultation with the European Regulators Group on Electricity and Gas and with account having been taken of the Trans European Energy Networks Axes of Priority European Interest;
- include a right for regulators to intervene to accelerate the completion of projects and, where necessary, to issue a call for tender on certain projects in the event that the Transmission System Operator is unable or unwilling to complete the projects concerned.

ACTION 3 A further **Revision of the TENs guidelines for electricity** which will, in particular, integrate the new Member States into this framework.

4 MEASURES NECESSARY IN THE GAS SECTOR

4.1 Introduction

As for electricity there is a need to ensure that the gas network is adequately developed to provide both a competitive market structure and ensure security of supply. This point has been emphasised in successive Commission Communications on the energy market. The current situation for gas is however subtly different. Firstly, because actual physical congestion of pipelines is not so frequent and there should already be scope for considerable cross border trade if the regulatory framework was improved; and secondly, because an important difference between gas and electricity is the possibility of storing gas and the greater degree of interruptible consumption. For this reason, an event analogous to a general “black-out” is not likely. This means that the concerns relating to the timing of investment do not have the same degree of importance. However it is still necessary that required infrastructure is developed. It is also of note that the security of supply question is equally related to investments outside the EU.

4.2 Measures to support security of gas supply

The Green Paper on Security of Supply showed that Europe will become increasingly dependent on imported energy. According to the EU 25 baseline scenario, 62% of primary energy will be imported by in 2030 (compared to 47% in 2000). A large part of this increase will be natural gas and, as already stated in the first Infrastructure Communication and the recent document on energy co-operation with the neighbouring countries¹⁵, important investments are necessary to transport gas from the producing countries to Europe whether by pipeline or through LNG imports. The need to have a close energy dialogue with neighbouring countries, several of them being gas production or transit countries for Europe, was emphasised in this document. The EU-Russia energy dialogue is the most important example of this and it will continue to be a high priority.

New investment will be needed both within and outside the Community. The internal gas network of the EU must also be developed to ensure that sufficient capacity in the EU system is available. The modalities of reserving capacity in the EU network must also be such that long term investments are supported. This implies long term capacity reservations will continue to form a key role in arrangements for third party access. This is not a problem for the internal market provided that the allocation of capacity rights is organised in a transparent and non-discriminatory way.

Questions of security of gas supply have already been addressed in the Commission's proposal for a Directive on gas security of supply. On 11 September 2002, the Commission proposed a Directive concerning measures to safeguard security of natural gas supply in the context of the internal market¹⁶. It is the intention of the Commission to continue to work towards this objective.

ACTION 4 the completion of the **Directive on Gas Security of Supply** will;

- establish common minimum base level criteria that would be respected by all Member States regarding security standards, and,
- require all Member States to assign clear, transparent and non-discriminatory roles and responsibilities to market actors.,
- establish a Community mechanism to co-ordinate action in the event of a major gas supply disruption.

It is important that discussions on this proposal in Council and the European Parliament are rapidly concluded.

4.3 Measures to develop the internal gas market

For gas, the functioning of the competitive market is heavily influenced by the availability of gas from those countries with reserves. Other than the remaining UK and Dutch resources, there are essentially four main significant sources of external natural gas for the European Union; Russia, Algeria, Norway and Liquefied Natural Gas (LNG). New sources such as

¹⁵ Communication from the commission to the council and the European parliament on the development of energy policy for the enlarged European union, its neighbours and partner countries, COM(2003) 262 final, May 2003

¹⁶ COM(2002) 488 final

Egypt, Libya and the central Asian republics are also being developed. For instance, Caspian gas has already been traded in the EU internal market. However, if customers in Member States have access to gas from only one of these sources then the internal market cannot function. The objective must therefore be that individual customers in the EU should all have the potential access to buy from a portfolio of the various primary sources of natural gas that are available. This clearly requires a well developed network and consistent rules at EU level.

Russia is already the largest single energy partner of the European Union. In 2001, over 40% of European Union gas imports came from Russia. Further integration of the EU and Russian gas markets, based on common regulatory principles and long term contracts, would thus increase security of supply and facilitate the financing of important infrastructures. Therefore, in October 2000, an energy dialogue on a regular basis between the European Union and Russia was set up. In the three years of its existence, the Energy Dialogue has assisted in developing trust and a better understanding of our policy objectives in the energy field, and significant progress has been made on a number of the issues identified. Only recently, for instance, it was possible to find mutually acceptable solutions regarding a number of restrictive clauses in existing long-term contracts, which have been revised and made compatible with EC competition rules.

Within the Community, in most cases, sufficient physical capacity is already available to permit customers to choose between different portfolios of wholesale gas in the way described above. However, the current lack of coherence of tarification mechanisms used in different countries, the non-transparent procedures for reserving capacity and the overall operational practices used in gas networks mean that the full potential of the network to support competition is not being used.

The second benchmarking report shows that, based on a national market definition, there is currently a very concentrated market structure. In most cases one company controls well over 50% of the gas produced or imported. The Commission's survey of large consumers covering, in particular, Germany, Italy, Austria and Belgium showed that **75% of those surveyed** were unhappy with the development of the market and 80% of these cited import capacity or market dominance. Overall, the following problem areas exist:

- The Nordic and Baltic markets, where new investment is needed to increase the diversity of gas sources available;
- Germany, where inconsistent distance related tariffs mean that the scope for competition through Third Party Access is constrained;
- France, where weak internal connections and lack of cross border capacity to neighbouring countries may be restricting scope for competition;
- Spain, where a large proportion of entry capacity is still contractually congested and where there is little interconnection with other Member States;
- the UK, where new connections to mainland Europe may be required to provide some diversification away from North Sea supplies;
- Italy, where new connections to the north are necessary to bring in alternative sources of gas to compete with Algerian supply;
- Austria and many of the new Member States where a greater range of gas sources are needed.

Unlike electricity, these examples do not systematically result from a lack of physical capacity in the network. Indeed, it is of note that the construction of gas infrastructure does not tend to suffer from the same concerns that exist for electricity. For example, most gas infrastructure is underground already, so there are not the same environmental objections. There are also more possible sites available to locate gas infrastructure.

However it is clear that the key issue in gas, therefore, is the need for binding Community rules on issues such as tariffication and capacity allocation procedures to be developed. Without this, network users will be faced with a patchwork of different regimes in this regard which will reduce scope for competition. Once such rules are developed, it will be more accurate to speak of a true EU market for gas. When this happens, the large market shares of former incumbent companies will not be a problem as they will quickly face the threat of competition from cross border movements of gas.

The Guidelines for Good Practice agreed at Madrid in September 2003 relating to third party access to gas networks will, once implemented, already significantly add to the degree of competition that is possible with out further investment. The Guidelines represent a major step forward for the internal gas market, and it is expected that the majority of the issues covered in these guidelines will be implemented by TSOs in the context of their relationship with regulatory authorities as envisaged in the new Directive.

It is vital, in order to ensure the development of a real internal gas market, with a level playing field, that the rules contained in the Guidelines for Good Practice are legally enforced and that an appropriate legal framework exists to ensure their evolution over time. It is therefore now considered necessary to propose a Regulation on cross border trade for gas, based on the above guidelines, similar to the measure adopted for electricity by the Council and Parliament in June 2003.

ACTION 5 Regulation on Cross Border Trade in Gas which will

- mirror the existing legislation for cross border electricity exchanges;
- provide for the adoption of detailed binding guidelines, based on the current Guidelines for Good practice agreed at the Madrid Forum and covering:
 - Third Party Access services to be offered by Transmission System Operators,
 - capacity allocation and congestion management, including use it or lose it and secondary trading mechanisms,
 - transparency requirements,
 - tariff structure and derivation, including balancing charges.
- provide a method for the evolution of these Guidelines through Comitology;
- require national Regulators to ensure that the agreed guidelines are implemented.

4.4 Measures to improve the gas transmission network

In some parts of the European network real physical congestion exists. In these cases new investment is required to alleviate the problem. These bottlenecks are mainly in the western and south western part of the EU such as between northern and southern France and between France and Spain. However, as demand is growing rapidly it is expected that further congestion points might also develop. There are also a number of regions of the EU where the use of natural gas is only a recent development. Such networks will need to be extended in order to accommodate greater take up and extend to new areas the benefits of gas as a primary energy source.

At this stage, however, it is not thought a specific infrastructure measure is needed since the systemic congestion that exists for electricity is not present for gas. The only action proposed at present in this respect is therefore:

ACTION 6 A further **revision of the TENs guidelines** which, as for electricity, will integrate the new Member States.

5 CONCLUSIONS

The Actions proposed in this Communication are required as a matter of urgency.

Firstly, the proposed Directive concerning energy end-use efficiency and energy services will contribute to a sustainable energy supply. This measure will set achievable targets for Member States and remove the existing barriers to the provision of energy efficiency measures and energy services. This approach contributes to the Community's commitments to reduce greenhouse gas emissions.

In conjunction with the above measure, the proposal for a Directive of the European Parliament and of the Council concerning the measures to safeguard security of electricity supply and infrastructure investment will complement the development of the internal market by requiring Member States to ensure that investors have a stable framework for constructing new transmission capacity and ensuring an ongoing balance between supply and demand.

Likewise, the proposal for a Decision of the European Parliament and of the Council revising the guidelines for trans-European energy networks will, in conjunction with the Directive above, give an impetus to the most important energy projects that are vital to provide a competitive market with a secure supply.

Without these measures, in particular a focus on a higher level of interconnection, there is a clear likelihood that the opening of the electricity market will not provide the expected benefits, the internal market will not be completed and exchanges between different Member States and TSO areas will continue to be hindered and the scope for real competition will be dramatically reduced. In addition, for gas, the proposed Regulation of the European Parliament and of the Council on Gas Transmission and Cross Border Trade will allow for measures to be taken that will significantly improve the use made of the existing gas transmission network. This measure will give an important boost to competition and help further increase opportunities for customers to exercise their new rights.

ANNEX 1 Review of Progress and Actions since the 2001 Communication on Energy Infrastructure

The Commission's Communication on Energy Infrastructure was published in December 2001. In this document the Commission highlighted the importance of improving infrastructure for the reasons of security of supply, competition and the environment. In the document, the Commission proposed 13 actions to improve the use of existing infrastructure and to enhance the development of new infrastructure. The status of these actions is described below.

1. Amendment of the electricity and gas directives and adoption of the regulation on cross-border trade on electricity

The package of the electricity and gas directives and adoption of the regulation on cross-border trade on electricity was adopted in July 2003. The electricity and gas markets will be fully open by 2007 with legal unbundling is required for the transmission system operators. Regulated third party access is confirmed as the basic rule and the Regulation on cross-border trade in electricity will considerably harmonise the rules on cross-border trade of electricity in Europe. This will greatly enhance the use made of existing infrastructure.

2. Revision of guidelines on transparency and congestion management in electricity

The Council of European Energy Regulators has worked on the guidelines on transparency and congestion management in electricity. A set of principles on congestion management was presented in the 9th Florence forum in October 2002 and rules based on these principles were presented in the 10th Florence forum in July 2003. The revision of the guidelines will be continued in the forthcoming Florence forum and will be finalised in the regulatory committee which will be set up following the entry into force the regulation of the cross-border trade in July 2004.

3. Implementation of the congestion management guidelines agreed in the 6th Florence forum in November 2000.

A status report made by the Commission together with the Council of European Energy Regulators for the 9th Florence forum in October 2002 indicated that the congestion management guidelines agreed in the 6th Florence forum in November 2000 were only half way implemented. The level of implementation varies considerably between member states, for several key items as introduction of market based mechanisms the implementation has been far from satisfactory. This confirmed that binding rules which are part of the guidelines foreseen by the regulation of cross-border trade of electricity are necessary.

4. Harmonisation of technical and administrative rules regarding the operation of interconnectors.

The harmonisation of technical and administrative rules regarding the operation of interconnectors has progressed in the work lead by UCTE. It aims at a revision of the existing recommendations of security and reliability rules in interconnected networks through a transformation of the existing recommendations in a UCTE handbook. The first drafts were presented in the 9th Florence forum in October 2002 and a public consultation was opened in July 2003. The Regulation on cross-border trade of electricity provides for the possibility to include in the guidelines on congestion management common rules on minimum safety and operational standards for the use and operation of the network.

5. Tarification of cross border exchanges of electricity

The European Transmission System Operators proposed a system to compensate for cross-border flows of electricity which was accepted at a temporary basis by the European Commission and the Council of European Energy Regulators. It entered in to force in March 2002. An improved system was implemented for the year 2003 and a further improved version with the abolishment of the export fee component was agreed in the 10th Florence forum in July 2003 to cover the year 2004. Future development will take place in the framework of the regulatory committee of the regulation of the cross- border trade.

6. Further measures on transparency of the gas network operation; and

7. Guidelines on congestion management and cross-border transmission tarification on gas

As part of the discussions at Madrid Forum on third party access to the gas network, a set of Guidelines for Good Practice were agreed at the fifth meeting in November 2002. These have been implanted relatively well although with some deficiencies in individual Member States.. A key improvement is the publication of cross border capacity information by GTE which has been implemented from January 2003. A further revision to the guidelines was agreed at the seventh meeting in September 2003.

8. Guidelines on regulatory control and financial reward for infrastructure

The Council of European Energy Regulators presented principles on regulatory control and financial reward for infrastructure in the 10th Florence forum in July 2003. This topic is further discussed in this second communication on infrastructure with the proposal that these principles form a framework for TSOs and Regulators to compile a multi-annual strategy for the improvement of infrastructure links, including the financial framework.

9. Priority projects of European interest

Individual projects of Priority Projects of European Interest were included in the revision of the Trans European Network Energy guidelines, adopted in June 2003. A further revision of the guidelines, to take account of accession and the importance of incorporating neighbouring countries into the wider energy market, were the subject of a consultation that finished in September 2003.

10. Commission report on Security of supply

Both electricity and gas directives require the member states to monitor the situation regarding security of supply. The Commission will make a summary report every second year on the situation in Europe with the first Commission report scheduled for 2004/2005. The possibility for further obligations on Member States and the Commission are discussed in this second Communication.

11. Repealing of regulation EC No 736/96 requiring member states to provide Commission with information on electricity, gas and oil infrastructure

Repealing of the regulation EC No 736/96 requiring member states to provide the Commission with information on electricity, gas and oil infrastructure is under way and should take effect in 2004.

12. Communication on EU external energy policy

A Communication of the Commission “On the development of energy policy for the enlarged European union, its neighbors and partner countries” was adopted in May 2003 (COM(2003) 262 final).

13. Long term investment in gas supply

In September 2002, the Commission proposed a Directive covering Gas Security of Supply.¹⁷ This suggested that Member States should have published standards relating to security of supply and the power to put obligations on individual companies to ensure those standards are met.

Further work is needed in order to ensure the existence of commercial and financial conditions within the EU for the long-term investment in gas supply infrastructure. The Commission communication “On the development of energy policy for the enlarged European union, its neighbors and partner countries” from May 2003 also addressed the long term gas supply.

Summary

Most of the actions have been completed, sometimes with a slight delay compared to the original time schedule. In the meanwhile the accession of 10 new member states has been confirmed, creating further challenges to the development of the energy infrastructure. New member states are already participating in the regulatory Fora and will be fully integrated in all relevant activities at the accession in May 2004. The accession creates an immediate need to revise the Trans European Energy Network guidelines, which is proposed in a package together with this second infrastructure communication.

¹⁷ COM(2002) 488 final

ANNEX 2 Encouraging New Electricity Infrastructure

2.1 Introduction

New transmission investment will make a key contribution to the satisfactory performance of the electricity market. However progress is slow at present due to two main concerns:

- delays in completing the required and necessary assessment processes to receive permission to build ;
- the lack of clarity of the regulatory and financial arrangements for investment, even for unbundled transmission system operators.

Although the construction of new transmission infrastructure often involves controversial and difficult decisions, it is the view of the Commission that, without such investments, the functioning of the market and, in some cases, security of energy supply will deteriorate rapidly. The current position, whereby the granting of planning permits involves a very lengthy procedure over a number of years, must not be allowed to continue.

2.2 Environmental and planning permit issues

Environmental Assessment is a key element of the EU sustainable development strategy. The Community requirements for such projects are set out in the Environmental Impact Assessment Directive¹⁸. Successful environmental appraisal is an important part of the decision making process which avoids unnecessary damage to the physical or aesthetic environment and saves money by avoiding expensive mistakes.

In various parts of Europe, however, difficulties in getting the required approvals has meant that several projects in advanced stages have been cancelled and there are even important projects which are almost finished but only some short parts are missing. There are also examples of interconnectors between countries where one party has failed to finish the link whilst the other party has built the line to the border. Examples of these shortcomings include the links between Belgium-France, Italy-Switzerland, Italy-Greece¹⁹ and key projects to reinforce the Austrian network.

It would appear that only limited efforts have been made to explore ways in which the appraisal procedure could be speeded-up, for example by a stricter adherence to the planning approvals timetable including the avoidance of duplication of assessment referred to in Directive 2001/42, or by the use of less obtrusive technologies such as underground lines or by investing close to other infrastructure projects such as road and rail links.

The following list contains items that can considerably improve the public acceptance of the project and help in a timely completion of them²⁰.

- Major new projects should have the support from the European, national and local authorities with the need for the project clearly explained with unconditional

¹⁸ Directive 2001/42/EC, 27 June 2001

¹⁹ Example: A 7 km part of the Santa Sofia – Matera line in the Southern Italy. This line is at the moment limiting the use of the Italy – Greece undersea cable.

²⁰ This topic has been discussed in the Eurelectric report “Public acceptance for new transmission overhead lines and substations”, March 2003.

support received from the authorities. Member States should give preference to those identified in the list of Trans European Networks Projects of Priority Interest. The European Union should support such projects and regularly review progress.

- Close dialogue in advance with the people affected by the line should provide a real possibility to influence the routing and help to overcome any concerns. Proper compensation for any negative impact is also an important element in getting acceptance for the project.
- Shorter time periods should be possible for the design and permit phase of major projects without reducing the possibilities for stakeholders to give input to the process. Better co-ordination of different phases of the design, consultation and permitting activities would contribute to this. Projects which have already been accepted as priority European Interest by Member States at Council in the context of the Trans European Networks programme should be a special category in this regard and every effort should be made to accelerate these procedures with the benefit to the EU as a whole being an appropriate consideration to take into account.
- Several technical alternatives can be used to alleviate the impact of infrastructure to the environment and the people living close by. Selective undergrounding of transmission lines has become technically and economically possible. Use of other less visible layouts such as new designs for pylons has also been successful in some projects.

2.3 Use of new technology such as undergrounding

Underground cables have been used for many decades for the transport of electricity in low and medium voltage networks in urban areas. For high voltage and extra-high voltage networks underground cables were used (in the form of oil-filled cables) only in exceptional cases owing to their high cost in comparison with the equivalent overhead lines carrying the same electricity flow. More recently, however, a new generation of underground cables has emerged, which are lower cost and easier and quicker to install. The Commission has already supported studies under the framework research programme relating to improved underground cable technology.²¹

Despite the advances that have been made, the construction cost of underground cables is considerably higher than the equivalent overhead lines for high voltage and extra-high voltages (between 5-20 times higher). This would seem to rule out a general application of such technology in view of the impact this would have on the price of electricity.

However, underground cables also experience fewer losses and lower maintenance costs and a lifetime comparison of costs of cables versus overhead lines may render the use of underground cables a feasible solution in special cases such as urban areas, environmentally sensitive areas and regions prone to adverse weather conditions where security of supply may be jeopardised.

²¹ E.g. Fifth Framework Programme CORDIS RTD Project no. 67584, 1/1/2003-30.6.2006

A fuller analysis of the issue of undergrounding of electricity lines in Europe and especially in the framework of Trans European Energy Networks is discussed in a separate technical document which has been placed on the website of the Directorate-General for Energy and Transport.²² This shows that low and medium voltage networks are already often placed underground (more than 40%), while for high voltage networks (around 10%) and the extra-high voltage networks (1-2%), the percentage of undergrounding is much lower. The document also contains a review of the potential economic benefits that could be provided by undergrounding cables despite the additional capital costs, which is summarised in Table 1 below. This shows that certain connections such as France-Italy would be expected to yield a positive benefit despite the extra cost of underground connections, whereas for France-Spain the calculations are less favourable.

Table 1: Cost –Benefit analysis of underground electricity interconnectors²³

| Interconnection | Option | Cost € million | MW | Cost €/MW | NPV revenues €/MW | Net benefits €/MW |
|-----------------|------------------------|-------------------|------|--------------|----------------------|----------------------|
| France-Italy | Existing rail Tunnel | 760 | 2000 | 380,000 | 567,238 | 187,238 |
| France-Italy | New electricity Tunnel | 900 | 2000 | 450,000 | 567,238 | 117,238 |
| France-Spain | Mediterranean Cable | 1,500 | 1200 | 1,250,000 | 586,398 | -663,602 |

Overall, there is some room for a concerted effort in Europe to extend the use of underground cables in exceptional cases, where the extra cost of underground cables can be justified such as:

- in areas which are badly affected by adverse weather conditions (winds, snow, ice), the security of supply can be enhanced by the undergrounding of electricity lines. Such a policy had been adopted by France after the 1999 storms that paralysed significant parts of the French electricity system.
- in specific segments of the missing cross-border electricity links that are considered as priority projects in the Trans European Energy Networks Guidelines of July 2003.

2.4 Overcoming financial and regulatory barriers

Financial barriers to investment may also exist due to an inappropriate or unclear regulatory regime for new investments. In order to prevent this, it is clear that Transmission System Operators must be rewarded for investments at an appropriate level so that the returns on such investment at least cover the justified cost of capital of the business concerned. Generally speaking, the Commission believes that Transmission System Operators, with their detailed technical knowledge of the network are the best placed to put forward and implement new investment projects. However the Commission also proposes a strengthened role for the

²² http://europa.eu.int/comm/energy/electricity/infrastructure/index_en.htm

²³ This assessment was carried by ICF Consultants in their Report to the European Commission. The cost of constructing additional underground capacity across a number of borders has been compared to the projected benefits. The benefits have been estimated from forward electricity price curves produced by the ICF Consulting power market model (the Integrated Power Model). The analysis has been carried out on a marginal MW basis, i.e. what benefits would one additional MW of capacity produce.

appropriate regulatory authorities in order to clarify the financial framework and ensure that the required investments are carried out. Indeed, the Commission itself has initiated some interconnection projects as a consequence of merger decisions, for example the EDF-Hidrocantabrico case, on of the conditions for the approval of the merger was an increase in interconnection between France and Spain up to 4000MW from the 1100MW available at the time.

As one of the Actions identified in the Commission's 2001 Infrastructure Communication, the Council of European Energy Regulators has produced a document assessing the different possibilities for the regulatory and financial framework for new investments²⁴. This document was presented to the European Electricity Regulators (Florence) Forum in July 2003 and identified three main options for the financial regulation of new infrastructure projects:

- (a) regulated reinforcement with regulated tariffs;
- (b) non-regulated reinforcement with regulated tariffs;
- (c) non-regulated reinforcement with non-regulated tariffs, so called "merchant" lines.

The Commission believes that these options, or a combination of them, form an acceptable framework for developing new infrastructure, depending on the circumstances of each individual investment project. However, in order to give regulatory certainty, the framework to be applied should be known in advance by potential developers. The attached proposal for a Directive envisages that the regulatory authorities should have rights to influence the investment programme of the Transmission System Operators concerned and, if progress on certain investment projects is unsatisfactory, regulators should also have the right to arrange for such work to be conducted by a third party, including the right to launch a tender process.

In order to do this, there needs to be a careful appraisal of each potential project that could be undertaken in the next few years. This is necessary since, where regulators commit to underwriting an investment project through transmission tariffs, i.e. approach (a) above; they are committing the money of electricity and gas consumers. It is expected that one of the first tasks of the new European Regulators' Group for Electricity and Gas will be to develop a common framework for new investments for the internal market.

2.5 Conclusions

The strict environmental and permitting procedures relating to the construction to new infrastructure are necessary and should not be taken lightly. However every effort should be made to accelerate progress and this requires Member States and their regulatory authorities to assume a greater degree of control and responsibility. The Energy Council has already identified, within the Trans European Networks framework the priority projects which are in the European public interest and these projects should be implemented without unnecessary delay. For these, solutions need to be found to accelerate the planning process and where necessary new technology such as undergrounding of lines needs to be considered.

²⁴ CEER: Principles on regulatory control and financial reward for infrastructure, paper presented in the 10th Florence forum in July 2003.

In order to remove barriers to the construction of infrastructure projects in a reasonable time, two new concepts are introduced in the revised guidelines of the Trans European Energy Networks. Firstly a Declaration of European Interest for particularly important cross-border projects gives a highest priority to especially important projects. These projects should get a priority regarding Community financial instruments, within specific rules of each of the instruments. Secondly these projects should enjoy a well co-ordinated planning procedure in order to avoid unnecessary delays.