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from: Secretary-General of the European Commission,  
signed by Mr Jordi AYET PUIGARNAU, Director

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to: Mr Javier SOLANA, Secretary-General/High Representative

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Subject: Report from the Commission to the European Parliament, the Council, the  
Economic and Social Committee and the Committee of the Regions on the  
implementation of the guidelines for trans-European energy networks in the  
period 2002-2004 pursuant to Article 11 of Decision 1229/2003/EC

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COMMISSION OF THE EUROPEAN COMMUNITIES

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**REPORT FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN  
PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND  
THE COMMITTEE OF THE REGIONS**

**ON THE IMPLEMENTATION OF THE  
GUIDELINES FOR TRANS-EUROPEAN ENERGY NETWORKS  
IN THE PERIOD 2002 –2004**

**Pursuant to Article 11 of Decision 1229/2003/EC**

**{SEC(2006) 1059}**

This report is written in accordance with Article 11 of Decision No 1229/2003/EC of the European Parliament and of the Council of 26 June 2003 laying down a series of guidelines for trans-European energy networks and repealing Decision No 1254/96/EC<sup>1</sup>.

This implementation report presents the synopsis of the framework underlying the policy of Trans-European Energy Networks (TEN-E) and the scope and objectives of the guidelines together with a summary of the progress in implementation achieved during the period 2002 to 2004. It is based on information received from the transmission system operators and from Member States' experts.

The annex to this report presents the details concerning the implementation of electricity and gas connections during the period 2002 to 2004.

## **1. Framework of the TEN-E Policy**

The security of energy supply and the functioning of the internal energy market are key policy goals. This is mirrored in the Trans-European Energy (TEN-E) guidelines aiming at the installation of an electricity and gas network of truly European character by linking better the fragmented national networks.

The European Union policy concerning Trans-European Networks is based on three cornerstones: the legal basis for TENs, Articles 154-156 of the EC Treaty, introduced by the Treaty on European Union, the regulation on TEN financial support<sup>2</sup> and the guidelines Decision for Energy TEN's, which identifies axes for priority projects and projects of common interest.

The purpose of the Community action, set by the Treaty, is to promote the interconnection and interoperability of national networks as well as access to such networks within the framework of open and competitive energy markets.

The guidelines present the purpose, scope and objectives of Community action, together with project lists in the annexes. The guidelines specify the eligibility criteria, according to which projects can obtain financial support. As a result, the financial regulation can support a number of well defined projects of common interest.

## **2. TEN-E guidelines**

The European Community guidelines for TEN-Energy were adopted in 1996, comprising a list of projects of common interest. The list of projects has been revised twice, in 1997 and in 1999. The recent revision of the guidelines came into force in June 2003. It identifies axes for priority projects and projects of common interest, the implementation of which is analysed in this report.

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<sup>1</sup> OJ L 176, 15.7.2003, p. 11.

<sup>2</sup> OJ L 228, 23.9.1995, p. 1, Council Regulation (EC) N° 2236/95 of 18 September 1995 laying down general rules for the granting of Community financial aid in the field of Trans-European Networks, as last amended by Regulation (CE) N° 1159/05 of the European Parliament and of the Council of 6 July 2005 (OJ L 191, 22.7.2005, p. 16.)

The guidelines for the development of the trans-European energy networks aim to establish the effective operation of the internal energy market, developing cohesion in the Union, reinforcing security of supply and protecting the environment. Linking national networks and constructing additional interconnections between Member States is an element of integration, introducing a European energy transmission network. Of key importance is the completion of a selection of projects on the priority axes which are of cross-border nature or which have significant impact on cross-border transmission capacity.

The axes for priority projects take account of the connections that are required for the efficient operation of the internal market and for security of energy supply. The challenges for electricity and gas networks are different:

i) The existing capacities of the electrical interconnections are largely insufficient for the further increase of exchange and trade. Consequently, in March 2002 at the Barcelona European Council, the heads of state and government agreed to set a target for Member States, according to which the level of electricity interconnections should be equivalent to at least 10% of their installed production capacity by 2005.

ii) Concerning natural gas, there will be a strongly increasing dependence on gas imports in the next 20-30 years. Within the TEN-E policy, a realistic target was to set up an additional gas import capacity of 70 Billion Cubic Meter by 2013, from sources in Russia, North Africa, the Caspian Sea region and the Middle East. The main suppliers of natural gas at present are Norway, Russia and North Africa. In the future, the Caspian Sea, the Middle East and the Gulf region will become additional important suppliers. These sources define the natural transit routes.

The axes for priority projects that follow from these challenges are described in the annex, section 1.

## **2.1 Identification and Prioritisation of the TEN-Energy Projects**

Community action for the development of energy networks concerns the main transportation/transmission networks for electricity and natural gas, excluding distribution networks.

A project may be of common interest if it corresponds to the objectives and priorities specified in the guidelines and displays potential economic viability. The inclusion of a project in the list of projects of common interest is without prejudice to the assessment of its environmental impact.

Whereas originally ten projects, the so-called “Essen Projects” adopted by the Essen European Council in December 1994, were considered necessary, this list was increased very quickly through a **bottom-up approach** to about 200 projects of common interest in 1999. In the revision adopted in 2003, more than 220 projects were decided upon.

In the recent revision, a hierarchy in the projects was introduced. In addition to improving connections in general, specific links need to be developed and given high priority. This led to a shift in strategy, namely to a **top-down strategy** tackling the highest priorities. As a consequence, the guidelines Decision for energy that was adopted in June 2003 identifies, in addition to the projects of common interest, axes for priority projects. In this way, the TEN-E programme responds to the increased dependence on gas imports, which implies a significant

increase in natural gas transport capacity, and the need for increased electricity interconnection capacity between the Member States, which would facilitate a more reliable and efficient grid operation and avoid black-outs.

Figures 1) and 2) display the axes for priority projects. The need to connect separate markets in the electricity sector is evident as well as the need for additional gas supply routes.

## **2.2 Implications from the TEN-E guidelines**

The report and its annex presents the progress made in the implementation of energy transmission infrastructure in accordance with the objectives of the European Union policy concerning Trans-European Energy networks (TEN-E). An essential aspect is that the typology of projects was modified by the revised guidelines adopted by the Council and the European Parliament in June 2003. Due to the long time scales needed for authorisation and construction, typically 5 to 10 years, it was considered necessary also to include the period 1996 to 2000 in the analysis. The connection between the new and old classification was made. Therefore, the implementation report is based on the typology of projects that was introduced in the guidelines Decision adopted in June 2003.

Further, the annex shows relevant information concerning the projects listed in the guidelines already in force as well as the contracts awarded under the TEN-E budget line. The data contained in the related tables was validated by Member States' experts designated by the TEN-E committee, in the course of 2005.

## **3. Progress in Implementation**

Since 1996, the gas and electricity sectors have displayed a different pattern concerning the implementation of projects. Whilst the security of gas supply has been managed well to-date, the lack of both electricity generation capacity and interconnection adequacy has led to serious congestion of specific lines, even to a series of electricity black-outs in the year 2003.

Of the list of 'Essen Projects' defined in 1994, the five specific gas projects went into operation soon afterwards. These were the main gas pipelines Algeria - Morocco - Spain and Russia - Belarus - Poland - E.U. and the new gas networks in Greece, Portugal and the south and west of Spain.

Of the five specific electricity projects, two projects became operational, the connection between the north of Portugal and Spain and the Italy - Greece interconnection. The three other projects have not been able to overcome the difficulties of administrative authorisations (for the France - Italy and France - Spain projects) or have lacked a construction decision (for the connection between the eastern and western parts of Denmark). This trend has continued for the projects put into operation during the period 1996-2001, which included 18 projects in the gas sector and 6 in the electricity sector.

### **3.1 Finalised Projects**

In Figures 3) and 4) (with details given in Table 1 and Table 2 in the annex) the projects that went into operation after 2001 are displayed; they comprise 45 electricity projects, a significant number in Spain, Portugal and south-east Europe, and 16 gas projects. Fourteen of these projects were supported by contracts under the TEN-E budget.

The corresponding cross-border projects (and those with high impact on cross-border transmission) that are priority projects include electricity connections on the axes EL.1, EL.2, EL.3, EL.4, EL.6 and EL.7 and further, gas connections on the axes NG.2 and NG.4, as indicated in the figures 3) and 4).

### **3.2 Projects under Construction**

In Figures 3) and 4) (with details given in Table 2 and Table 3 in the annex) the projects are displayed which are currently under construction. This list comprises 14 electricity projects, a significant number in Spain and Portugal, and 11 gas projects. Nine of these projects were supported by contracts under the TEN-E budget.

The corresponding cross-border projects (including one with high impact on cross-border transmission) that are priority projects include electricity connections on the axes EL.3, EL.4, EL.6 and EL.7 and further, gas connections on the axis NG.3 and NG.4, as indicated in the figures 3) and 4).

#### **3.2b Impact of additional cross-border connections**

The assessment of the impact of the finalised cross-border connections and those under construction is based on the capacity increase listed in tables 2 and 4 in the annex. For electricity connections, it is measured in 'net additional capacity' which is related to the 'net transfer capacity' of the country under consideration.

For Belgium, the net capacity increase of 900 MVA by the additional line Avelin-Avelgem to France corresponds to 16% of the actual net transfer capacity. For Italy, the increase provided by the phase shifter in Rondissone and the completed connection to Switzerland yields 22% of the net transfer capacity. The two lines connecting to Ernestinovo in Croatia correspond to 38% of the net transfer capacity. The two additional lines connecting Portugal with Spain can carry a major part of the net transfer from and to Spain. This implies that, in the case of a loss of one line, the second one still has sufficient capacity for essential power transmission. For Portugal, security of supply is, therefore, strongly increased.

These additional lines increase the electricity exchange significantly. In particular, Portugal now exceeds the 10% interconnection capacity target. However, other countries, including Spain, Italy, Greece, Ireland and United Kingdom, are still below this target. This articulates the need to strengthen security of supply in the Community by tackling congestion in the electricity networks and to respond to the actual transmission needs of the market. Therefore, additional cross-border electricity interconnections along the priority axes are still necessary.

For gas connections, the capacity increase is measured in billion cubic metres per year (Bcm/a). The Table 2 and 4 reveal that the new gas pipelines from Libya to Italy, from Algeria to Spain and from North Sea fields to the UK increase the import volume by up to 20 Bcm/a. The liquefied natural gas (LNG) terminals in operation or under construction increase the import volume by further 50 Bcm/a.

These figures constitute a significant part of the additional imports to the EU of more than 200 Bcm/a that will be needed from 2020 onwards, but new gas pipelines will still be necessary for securing and diversifying additional gas import capacity.

### **3.3 Authorisation phase**

The authorisation phase of the project implementation covers a wide range of issues, implying a rather lengthy list of tasks before the authorisation phase is completed. The list of projects in the authorisation phase (with details given in the annex) comprises 80 projects, 61 electricity and 19 gas transmission projects. Twenty-nine of these projects were supported under the TEN-E budget.

The large number of these projects indicates that streamlining authorisation procedures is essential for acceleration of implementation, in particular for cross-border projects of high European interest.

The cable link between Estonia and Finland (ESTLINK) constitutes the first and so far the only electricity connection of the Baltic states with other Member States of the European Union. Consequently, the motivation to complete this connection was high. The implementation took in total 7 years, of which 3 years were needed for the authorisation phase and only two years for the construction.

The development plan for the connection between Italy and Switzerland, S. Fiorano-Robbia, was started in 1992. In 2001, the studies on technical and environmental feasibility were carried out. Once the feasibility and preliminary design were achieved, a long and painful authorisation process started. It is worth mentioning that the approval of the project was obtained thanks to a series of compensation measures and environmental impact mitigation, such as the dismantling of existing overhead lines in the area affected by this new project. The new line was finally completed at the end of 2004 (after 12 years) and its operation began on 20 January 2005.

These examples confirm that, for electricity lines, the total duration for a project to be completed is 5 years when there is no obstacle or opposition. Even without major obstacles, the reality is that in the most recent cases, the delay between the first planning and its entry into operation is usually about 10 years. When there are real obstacles and opposition, projects are not reaching the construction phase after 12 to 20 years (Bescano (ES)-Baixas (FR) is an example and still not agreed). In some cases, they never take off after 10 or more years of discussions, as is the case for the line Lienz (AT) – Cordignano (IT).

There are major differences in the public perception of the risks and impacts associated with high-voltage overhead lines compared to gas pipelines, which face typically less delays. Recently, objections to the construction of LNG terminals were raised, both on the local and regional level. In the case of the terminal at Rosignano (IT) there was, in spite of the agreement at national level, significant opposition to the project by the local municipality of Rosignano, which wanted certain parts of the plant to be constructed at another location in its territory further inland. After three years of additional environmental impact assessment, a solution appears feasible and construction could start soon.

### **3.4 Progress during the period 2002-2004**

Concerning the gas network, an important link between France and Spain and new liquefied natural gas (LNG) terminals in Carthagena, Bilbao and Barcelona, Spain, have come into operation. Furthermore, a number of LNG terminals are under construction in Italy, Spain, Greece and the UK. In addition, a new pipeline from Lybia to Italy (Sicily) has come into operation.

Major projects in the authorisation phase include the pipeline from the Caspian Sea through Turkey to Austria, the Greece – Italy interconnector and the interconnector Denmark – Germany – Sweden, as well as a significant number of LNG terminals in Italy and Spain and an underground storage in Spain.

Concerning the electricity network, the existing link between France and Italy has been increased in capacity, a missing link between France and Belgium and a new line between Italy and Switzerland have come into operation, as well as additional connections between Spain and Portugal, in south-east Europe, between Sweden and Norway, Finland and Russia, inside Ireland and in Denmark. Furthermore, an under-sea connection between Finland and Estonia, a new interconnection between Bulgaria and the former Yugoslav Republic of Macedonia, lines between Spain and Portugal and lines in Ireland are under construction.

Major projects in the authorisation process include the connections between France and Spain, the Netherlands and the United Kingdom, in south-east Europe, including links between Greece and Bulgaria/ the former Yugoslav Republic of Macedonia/ Turkey, between Germany and Poland, Germany and Austria, Austria and Hungary and Austria and the Czech Republic.

The implementation of projects on priority axes during the period 2002-2004 is discussed in detail in the annex.

In addition, the implementation of projects in isolated regions was effectively supported by grants under the TEN-E budget line (with details given in the annex).

### **3.5 Community funding**

Under the TEN-E budget line, from 1995 to 2004, support of a total amount of 174 million EUR was awarded. This budget has mainly been spent on the co-financing of studies.

It is worthwhile to look at the support granted from the priority axis point of view. Concerning the amount spent for priority projects in the period 2001-2004, about 64 % of the available budget was awarded to these projects. The larger part of this amount was spent on the gas network, namely 62.8 %, and the smaller part of 37.2% was spent on the electricity network.

These figures were confirmed under the 2004 call for proposals, which was based on the guidelines adopted in June 2003, where the priority projects selected for funding received close to 64% of the total budget. The gas networks received 65% of the budget, which was spent on priority projects. These figures show that the priorities set previously are in accordance with the priority axes defined in the 2003 decision.

This shows clearly that the choice of the priority axes adopted in 2003 reflects the required improvement of energy infrastructure at European level. Secondly, it reveals that essential political and financial support can be focussed on the undertaking of priority projects.

### **3.6 Pivotal role of the TEN-E budget**

The size of the annual TEN-E budget is very modest in view of the required investments, namely about 0.2-0.5 % (Table 1 and Table 3 in the annex relating the TEN-E support given to the total costs). Nevertheless, the support given for studies can be essential for project planning in isolated or island regions. The related feasibility and engineering-type studies are

essential for these projects to start and can shorten the time-frame of the construction decision. In addition, the support for novel technologies for electricity transmission, such as putting lines underground or joint use of rail and road tunnels, provides a strong stimulus for such projects. Financial support for the engineering phase also accelerates the project and can trigger the construction decision. Cross-border projects received significant support under the TEN-E budget line, as detailed in the annex. In a few, well justified cases, it was possible to grant support for the construction phase. In these cases, the high profile support through the TEN-E budget is the essential element, not the size of the financial intervention. When the missing link has only a short length and, consequently, the total costs of the project are low, the TEN-E contribution can reach the order of 10%, otherwise it is smaller.

Specific TEN-E support for novel technologies:

#### Cable technology:

Support was granted to a number of sub-sea cable projects, where The Netherlands / Norway interconnector will be the longest sub-sea cable operated, including the cable connecting Scotland and England, with a view to the greater use of renewable electricity generation and several sub-sea cables for connecting different markets or islands with the main synchronous system. A novel approach is pursued for the implementation of gas insulated lines (GIL) to connect European off-shore wind generated power sites.

#### Synergy between high-voltage lines and rail/road tunnels:

Support was granted to study the possibility of a new connection through the Brenner basis tunnel between Austria and Italy as well as the integration of electricity and rail transport in the Lyon – Turin high-speed railway tunnel. The potential of new cable or GIL technology is analysed in detail.

#### Grid studies of European dimension:

Due to its strategic importance, 75% of the eligible costs are granted to study connections and interface between the extended western synchronous system, the Union for the Coordination of Transmission of Electricity (UCTE), and the eastern synchronous area, including the Unified Power System (UPS) of Russia including the Kaliningrad area, the Interconnected Power Systems (IPS) of Belarus, Ukraine, the Power Systems of Moldova, Georgia, Azerbaijan, the IPS of Baltic States and other connected systems. The result of this feasibility study will provide the essential information for the implementation decision.

Another example is the project analysing new connections between the Union for the Coordination of Transmission of Electricity and CENTREL (eastern Europe) systems.

### **3.7 EIB Loans and other Community grants**

As explained in the annex, energy infrastructure receives significant support through loans from the EIB or grants from other Community sources. However, a significant fraction of this support is often dedicated to energy infrastructure in general, including distribution networks, and not exclusively to interconnectors.

## 4. Conclusions

Based on the report in the annex, the Commission arrives at the following general conclusions:

- The objective of focussing the support on priority projects is being implemented.

The fact that, in the period 2001-2004, more than 60% of the TEN-E support was allocated to priority projects shows that the priority axes adopted in 2003 reflect the required improvement in the transmission infrastructure.

- Coordination measures concerning implementation should receive a high priority for TEN-E policy.

To accelerate the implementation of projects, special attention needs to be given to monitoring the progress in detail and to regular exchange of information concerning cross-border connections. The appointment of a European coordinator, as adopted in the TEN-T guidelines for transport, could constitute an appropriate measure and is proposed in the revision of the TEN-E guidelines.

- The political support by means of the ‘TEN-E label’ is becoming more and more essential for public acceptance and for accelerating the authorisation procedure. However, it is noted that authorisation procedures remain a major problem, since the delay between first planning and entry into operation is usually about 10 years.

The feedback from the transmission system operators shows that the Community expression of a specific European interest is seen as equally important to financial support and can contribute to the timely start of the construction.

- Within the long list of projects of common interest, a relatively large number of projects have progressed well – apparently without much support under TEN-E. But a closer look at cross-border connections, in particular along the priority axes, has revealed that in this sub-class, the impact of the TEN-E program was important (see Table 2 and Table 4 in the annex).
- The TEN-E budget, although relatively small, made a significant contribution to
  - initialising projects in isolated or island regions,
  - projects exploring the potential use of novel technologies or
  - triggering the construction decision for specific projects.
- The European Investment Bank (EIB) is well suited to playing a major role in better integrating the EU gas and electricity markets. Financing of the gas and electricity transmission infrastructure is already a traditional activity of the EIB, which should be pursued with regard to priority projects even more strongly in the future.

- It has become evident that an update of both the priority axes and the project lists<sup>3</sup> is a prerequisite for increasing support for better connecting the new Member States and the accession countries.

The full inclusion of the ten Member States that acceded on 1 May 2004 in the priority projects requires an update of the priority axes. The proposed revision of the TEN-E guidelines includes the corresponding additional axes for priority projects.

The main conclusions for electricity and gas networks are:

#### Electricity networks:

- The priority projects take into account the importance of cross-border trade for the liberalisation of the electricity market. Interconnections are still largely insufficient concerning the Barcelona 10 % target although progress was made.
- The completed connections and the connections under construction make a major contribution to removing congestion along the priority corridors. In particular, the cross-border links between France and Belgium (EL.1), between Italy and Switzerland and the phase shifter between Italy and France (EL.2), several lines between Portugal and Spain (EL.3), cross-border lines in south-east Europe (EL.4), connections increasing the transmission capacity between Ireland and Northern Ireland (EL.6), between Denmark and Germany, connections between Finland and Estonia, Finland and Russia and Sweden and Norway (EL.7) increase the transmission capacity considerably.

#### Gas Networks:

- The priority projects take into account the importance of cross-border trade for the liberalisation of the gas market.
- The completed connections and the connections under construction make a major contribution to increasing the gas import capacity along the priority corridors. In particular the cross-border link for gas supplies from Algeria via Morocco (NG.2), from Turkey to Greece or Austria (NG.3) and a series of new LNG terminals (NG.4) in Spain, Italy, Greece and the United Kingdom increase the import capacity considerably.

#### **Figure captions:**

Figure 1: Axes for Priority Projects concerning electricity networks.

Figure 2: Axes for Priority Projects concerning gas networks.

Figure 3: Progress in Implementation since 2001 for electricity networks.

Figure 4: Progress in Implementation since 2001 for gas networks.

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<sup>3</sup> Commission proposal for a revision of the TEN-E guidelines COM(2003) 742 final of 10/12/2003.