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# ELECTRICITY AND NATURAL GAS TRANSMISSION INFRASTRUCTURES IN THE COMMUNITY

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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL

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## Communication from the Commission to the Council

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# COMMUNICATION FROM THE COMMISSION TO THE COUNCIL ON THE INFRASTRUCTURES FOR THE TRANSMISSION OF ELECTRICITY AND NATURAL GAS IN THE COMMUNITY

## I. INTRODUCTION

1. This communication is made within the framework of work connected with trans-European networks[1] and the achievement of the Internal Energy Market[2].

   It represents first thoughts on the guidelines which the Community is to lay down under Article 129 C of the Treaty on European Union, covering in particular the objectives, priorities, projects of common interest and courses of action indicated in the realm of energy networks.

2. The present configuration of the electrical and gas systems is essentially the result of the policies aimed at achieving maximum self-sufficiency in energy followed at the national level. These policies are already accompanied by a certain amount of international cooperation justified on the basis of market supply needs. The transportation networks for electricity and natural gas have nevertheless been designed and developed with a view to the national dimension, a situation which is not compatible with the achievement of the internal market, the need for greater cohesion within the Community and the increased energy cooperation envisaged with the EFTA countries, central and Eastern Europe and the Mediterranean basin.

3. Attempts at closer integration of the natural gas and electricity transmission infrastructures are an essential means of completing the internal energy market while increasing flexibility and security of energy supplies.

   Recent proposals from the Commission[2] stressed the importance of changing the legal framework in the energy sector - in particular through the limitation of special and exclusive rights, the enhancement of competition and the introduction of new market rules. The proposals will only be effective in promoting intra-Community trade in gas and electricity if transmission infrastructures are strengthened and integrated at Community level.

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(1) Title XII of the Treaty on European Union.

(2) Draft Council directive on common rules for the internal market in electricity and natural gas (COM (91) 548 final of 21.2.1992).

4. The impending completion of the single market is serving to highlight the present disparities in national and regional energy supply and demand. The peripheral countries, notably Greece and Portugal which do not have natural gas networks at present, and Ireland, which is not connected to the gas or electricity networks of the Community, suffer particular problems of security of supply and reliance on imported oil. The poorest Member States have the highest energy use in relation to GDP (Portugal 59% and Greece 55% above the Community average), yet energy use per head is only 44% of the Community average in Portugal, 58% in Greece and 65% in Spain. These figures show that the poorer countries need improved access to cheaper more efficient sources of supply if their industries are to be price competitive in the single market. They will also face major changes in energy demand as they grow. Improved transmission infrastructures will be a key point of meeting their needs and ensuring the Community achieves greater cohesion. The survey of infrastructure needs prepared in the context of the mid-term review of the Community's Structural Policies(3) suggested, on the basis of plans by the gas and electricity industries, that total needs for investment in networks between 1994 and 2000 in Objective 1 regions amounted to more than 6000 million ECU.

5. The Community has already made an initial response to the development and strengthening of the networks in the areas which are eligible for support under the structural Funds. Between 1989 and 1993 some 1700 million ECU of the European Regional Development Fund is to be committed to energy infrastructure projects in Objective 1 regions under their Community Support Frameworks. A further 300 million ECU has been allocated to the Community Initiative REGEN for basic projects relating to the diversification of energy sources and the strengthening of the security of energy supplies.

6. The further integration of the electricity and natural gas transmission infrastructures at the Community level must also be accompanied by the development of energy exchanges with third countries. These exchanges are an essential factor in the security of supplies. Progress will have to be made, together with the completion of the internal energy market, to increase technical cooperation and the network integration with the EFTA member countries, the central and East European countries, the CIS and the countries around the Mediterranean basin. The signature in December 1991 of the "European Energy Charter", which had its origin in a memorandum put forward by the Netherlands Prime Minister at the European Council meeting on 25 and 26 June 1990 and included in the conclusions of the European Council meeting in December 1990, should provide the political framework for such developments(4).

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(3) COM (92) 84 of 18.3.1992.
(4) COM (91) 36 final of 13.02.1991.

7. The work on this communication was carried out by the Commission on the basis of studies from various sources and in consultation with the Member States, the trade groups concerned and the major electricity and natural gas consumers. The Commission examines, in this communication, the present situation and specific developments regarding the electricity and the natural gas transmission infrastructures.

## II. ELECTRICITY TRANSMISSION INFRASTRUCTURES

### A. The present situation

#### (a) The logical need for interconnections

8. The interconnected high-voltage (220/380 kV in Europe) electricity transmission networks have progressively developed, at the national and then the international level, from the regional networks in order to meet growing demand which was often at a distance from the production sites because of the geographical location of the primary sources initially used - water and solid fuels. Later on, the use of oil and gas allowed power stations to be built nearer consumption centres, thereby reducing the need to transmit electricity over long distances. More recently, the increase in the unit capacity of power stations, up to 1 300 MW for one nuclear unit, and the combination of several units at a single site because of the difficulty of finding new sites have increased electricity transmission requirements within the national networks.

9. Interconnections have the advantage of producing economies of scale over the number of production units operated in parallel and of meeting demand with a much lower total installed capacity than in an isolated system. They also make it possible to increase the use of the most economic means of production and to improve the quality and the reliability of the service through mutual assistance.

10. The Community today has a large network of interconnections (see map in Annex I). However, the part played by international interconnections is relatively modest, reflecting the partitioning of the electricity sector which is essentially the result of national policies based on self-sufficiency in electricity production. However, it must be recognized that, to some extent, this situation is a result of the historical development of the electricity transmission networks and of the great variety of choices made by the Member States with regard to the primary fuels used by the electricity supply industry.

11. The progressive establishment of international interconnections has been accompanied by the setting up of technical cooperation and management bodies.

    The UCPTE (Union for the Coordination of the Production and Transport of Electric Power) has been encouraging, since 1951, the international interconnection of high-voltage networks in Europe and the promotion of exchanges. It includes the companies of twelve European countries, mostly Community countries (except part of Denmark, Ireland and the UK), and those of Austria, Switzerland and Yugoslavia.

NORDEL has been handling cooperation between the Nordic countries (part of Denmark, Finland, Iceland, Norway, Sweden) in electricity supply since 1963. An important feature is the distribution of production between power plants in order to keep costs as low as possible.

Recently, the electricity companies in the twelve Community countries set up a European coordinating committee, EURELECTRIC, with a view to the completion of the Internal Energy Market. Associated with EURELECTRIC are also the Presidents of UNIPEDE(5), UCPTE and NORDEL and two representatives of electricity companies which are part of the European interconnected system but which do not belong to the Community.

(b) International exchanges

12. International exchanges of electricity by the Member States are still small and amounted, in 1989, to:

- imports: 6.6% of Community electricity consumption;
- exports: 5.5% of Community electricity consumption.

They have nevertheless doubled over the past 10 years and their growth has been three times faster than the growth in consumption. The balance of exchanges with third countries itself shows an excess of imports of 1.1% of the Community's electricity consumption (see Annex II).

These exchanges cover the following needs:

- the essential requirements of security of operation of the national networks and of mutual assistance;
- bilateral exchanges in order to exploit the most obvious potential for synergy (staggering of load curves, seasonal fluctuations in hydroelectric production), these exchanges most often being returned on a daily, monthly, annual basis;
- more recently, transmission of electricity produced in jointly-financed power plants or transfers of electricity agreed on the basis of long-terms supply agreements.

13. A detailed analysis of electricity exchanges between the member countries of the UCPTE shows the diversity of the situations in terms of the balance of imports and exports and of volume compared with the internal demand in each country.
Belgium, Spain and above all France, in the Community, and Austria, Switzerland and Yugoslavia, for the rest of the UCPTE, are, to widely varying extents, net exporters of electricity.

(5) UNIPEDE (Union of Producers and Distributors of Electrical Energy) was set up in 1925 and today includes representatives of 35 countries, 24 of them in Europe. Its aim is to improve the quality of services to users as economically as possible.

To illustrate the contrasting picture of Member States' electricity balances, it is enough to note that France's net exports, which amount to about 12% of its domestic consumption, are greater than the electricity consumed in countries such as Portugal, Greece and Denmark. Conversely, Italy imports 15% of its own domestic consumption, which is also more than the electricity consumed in these countries (see Annexes II and III).

## B. The Community dimension

14. The transition from the national to the Community dimension leads on the one hand to seeking an improved use and design on a Community scale of electrical infrastructures. On the other, the expected increase in trade following the application of the electricity transit directive and a greater opening-up of markets, possibly including some form of third party access, requires the reinforcement of interconnections and transportation networks.

**This transition from the national to the Community dimension, within the framework of a better integrated energy market, will require the essential balance in the security of operation of the interconnected networks to be maintained.**

15. Taking account of the Community dimension in the management of the electrical systems relying on interconnected networks, should allow supplementary economies to be made, beyond the gains already realised as a result of trade based essentially on bilateral supply contracts. With the present configuration of supply networks, including current projects, this supplementary saving, mainly achieved on the cost of primary energy used in power stations, would be, according to experts in the electricity industry, of the order of 1 billion ECU a year at present values, representing about 3% of the cost of electricity production.
The supplementary saving could be doubled in the event that transit capacities between national networks could be sufficiently increased to exploit fully opportunities for using least-cost production and economies of scale resulting in particular from the coordinated programming of maintenance and the reduction of the need for reserve production capacity.

### (a) Intensive use of interconnections

16. The more efficient functioning of the electrical system begins with the strengthening of competition in electricity production, leading to the priority use of the production centres with the best performance. At present, the function of determining production plans is exercised within the regulation and control zones, using a merit order for the production centres within that zone, with overall exchanges taking place particularly between adjoining zones.

Independently of the legal and commercial systems governing the production and transportation of electricity, increased competition between centres of production, situated within or outside the zone, will be reflected in increased trade since it will imply the consumption of electricity produced outside the zone when this is more profitable than the intensive use of production units situated within the regulation and control zone.

17. The increase in electricity trade will require, in the first place, **a more intensive use of existing transport capacities.**

Progress in this direction may be made by the **improvement of the information exchange** between the control centres of the electricity networks (dispatching) of the extent to which the networks and interconnections are occupied. This system should lead to the progressive creation, at European level, of greater **technical cooperation between control centres**, allowing better knowledge and more economic working of the European electrical system. This coordination is limited to a level of technical cooperation compatible with the rules of competition.

18. Greater integration of electrical systems will also be achieved by increased use of **more advanced equipment for network management** and voltage control. This more advanced equipment must make it possible to maintain the safety of the networks and the quality of the electricity transmitted, in particular in accordance with consumer requirements.

19. The **use of hydroelectric reserves**, which a number of countries are already jointly studying, together with possibilities as regards pumping, should also provide additional gains by utilizing complementarity with thermal power plants at the level of the UCPTE network.

Increased cooperation between the UCPTE and NORDEL networks should allow a greater exploitation of the Nordic hydraulic reserves, in the interest of both networks.

20. In more general terms, any changes in the management of the Community's electrical system would have to take account of the **membership of UCPTE and NORDEL of non-Community countries**, some of which occupy key positions in intra-Community electricity exchanges. For example, Switzerland accounts for one-third of the total capacity of interconnected lines between the twelve member countries of the UCPTE and is situated at the geographical centre of the system.

(b) Increasing the interconnections

21. The increased trade expected at the Community level means, secondly, that it is necessary to **increase the capacity for electricity exchanges**. Interconnections between France, an electricity exporter, and her neighbours are already being utilized at full transmission capacity. While the situation in other countries is less serious, there is only little scope for increasing exchanges. A major example of this situation is the transit of electricity between France and the Netherlands, which is limited by the low level of capacity available in the intermediary German and Belgian networks.

22. The **interconnection projects planned** by companies for 1995 meet three types of need (see Annex IV).

- In the first instance, it will be necessary to connect the national systems to the Community networks for their effective participation in the Internal Energy Market. The interconnection projects concerned are those between:

  . Ireland and the United Kingdom, and
  . Greece and Italy.

- Secondly, it will be necessary to strengthen both the national transit networks and their international interconnections in order to improve reliability throughout the already interconnected European system and to enable commercial exchanges to develop. Indeed, in an interlinked network, power is transmitted indiscriminately through the entire network from all generators to all users. Bottlenecks therefore show up as weak links in the network which are likely to disturb the operation of the system with the risk of power cuts being produced throughout wide areas.

  Projects being considered concern in particular:

  . the strengthening and construction of high-voltage lines between France, Spain and Portugal so as to increase the transit of electricity between these three countries from 1994;
  . the creation of new interconnections between France and Germany, Belgium, Italy and Switzerland to enable the capacity for exchanges between the countries' networks to be increased;
  . the establishment of interconnections by 1996 from Italy to Austria and Switzerland;
  . increasing the capacity for exchanges between Germany, the Netherlands, Denmark and Austria. It is also planned to develop interconnections from western Germany to the five new Länder from 1992;

. improvements to the internal networks in France (Rhône-Alpes region) and the Netherlands. Improvement of the German network would facilitate the transit of electricity within the Community;
. a possible doubling of the submarine links between France and the United Kingdom, which is being used to full capacity (2 000 MW).

- Thirdly, interconnections will have to be established between the Community States and the neighbouring non-member countries and existing capacity increased.

. The Community should pay particular attention, within the framework of technical and financial cooperation, to power links with the **Mediterranean non-member countries** to help further integrate the regional markets.
The medium-term objective is to link the power supply networks of Spain and Morocco, of Italy and Tunisia, and of Greece and Turkey.

. The transition of the **central and East European countries** and of the **CIS** to market economies again raises the question of cooperation with the Community in energy supply and the establishment of power links between the different systems. While there are plans for the new German Länder to be linked up by 1992 to the UCPTE system, there are no short-term plans for the central and East European countries. For these countries to have access to the UCPTE system, their networks and production facilities will have to have reached a sufficient level of development, which, according to initial estimates, might take about ten years. In the meantime, cooperation could be introduced on the basis of controllable exchange techniques.
Stations for the conversion of alternating current to direct current are thus now envisaged between Austria and Hungary, Germany and Czechoslovakia, and Greece and Bulgaria.

Within the first 2 groups of interconnection, the Commission Document "Europe 2000 : Outlook for the Development of the Community's Territory"(6) suggests that the plans to establish new or better electricity transmission links between Spain and France, France and Italy, Italy and Greece and the UK and Ireland are the most urgent.

(c) The prospects for the development of the electrical system

23. **In the longer term, new national and international interconnections** will be necessary in the light of the siting of new power stations, the increased opening of the market and greater competition at production level. Indeed, by 2010, 40% of production facilities will have to be replaced and extended to meet further demand. The trend, which began in the early

(6) COM (91) 452 final of 7.11.1991.

1980s, for some European countries to move away from the principle of self-sufficiency because of the problems they have had in developing their own production facilities should **strengthen European solidarity** and lead to the **abandonment of the principle of national self-sufficiency.**

However, because of the physical and economic constraints inherent in electricty transmission, the production shortfall as compared with demand in any given country should not exceed a certain level. It should also be guaranteed that electricity will be supplied on terms comparable to those relating to national production. Nevertheless, this maximum production shortfall is difficult to define because of the different characteristics of the national electricity systems. By way of example, Denmark is today about 30% dependent on net imports of electricity and Italy 15%.

24. In more general terms, consideration should be given to the **economic limits and the technical** implications of extending the interconnected alternating current networks. One possible way of developing the electric power systems might be to create large-scale direct current links between groupings such as the UCPTE, NORDEL, the networks of the United Kingdom and Ireland, the networks of the central and East European countries and the CIS. In this way, the fundamental balance needed would be struck within each of these groupings and additional transfers could be made by means of these links. Another possibility may be to develop electricity transfers between adjoining, non-synchronized groupings by means of links protected by the use of AC/DC/AC converters, a technique which makes it possible to control the power transmitted and which does not endanger network stability. These various solutions are currently being considered by the professional bodies concerned. This work should be speeded up in view of the impending transfer of electricity to the central and East European countries and exchanges with the CIS.

## III. NATURAL GAS TRANSMISSION INFRASTRUCTURES

### A. The present situation

#### (a) The gas market

25. The natural gas market in Europe is comparatively recent. It developed in the 1950s following the discovery and production of gas in fields of varying sizes in a number of countries (France, Italy, Netherlands, etc.) and gas exports from the Netherlands. The present configuration of long-distance natural gas transmission networks reflects the development of the market from a regional to a national and then continental scale as demand in Europe increased, making it necessary to obtain supplies from increasingly distant fields by pipeline from the North Sea, Norway, the CIS and Algeria or by means of port reception facilities for liquefied natural gas (LNG) mainly from Algeria. The storage areas spread throughout Europe also form an essential part of the gas network.

26. The present situation is characterized by two distinct areas in Europe where the development of natural gas is concerned (see map in Annex V). Some regional groupings have reached a stage of maturity and have a substantial and well-integrated transmission and distribution network. These are England and southern Scotland, northern Belgium, the Netherlands, large areas of Germany, France and Italy, and north-eastern Spain. Other regions are still developing their gas networks, while Greece and Portugal are planning to introduce natural gas in their markets.

    The share of natural gas in primary energy consumption varies widely from one country to another. It is about 50% in the Netherlands, 17-26% in Germany, the UK, Italy, Belgium and Ireland, 12% in France and Luxembourg, 9% in Denmark and 6% in Spain.

27. Natural gas consumption in the Community as a whole amounts to some 200 million tonnes of oil equivalent (toe) per annum, representing 19% of the overall energy balance. Of this figure, 80 million toe comes from external sources of supply, distributed evenly among three main suppliers (Algeria, Norway and the CIS). Within the Community the Netherlands supplies 24 million toe to other Member States, including 14 million toe to Germany.

Most forecasts for the year 2000 indicate an increase in consumption of over 25% in Europe and about a 40% increase in the volume of imports from outside the Community, thus making the Community more dependent on outside sources of supply (see Annex VI).

At present over half of the natural gas consumed in the Community is the result of international transactions and therefore the subject of transfrontier movements - 22% in transit through one or more intermediate countries.

(b) Security of energy supplies

28. This trend indicates the importance of developing the natural gas transmission networks and interconnections for the security of the Community's energy supplies.

Natural gas first of all provides an element of **diversification** of primary energy sources and, in particular, makes it possible to reduce dependence on imported oil which in certain Member States accounts for an excessive share of the national energy balance. In this respect, the establishment of natural gas in Greece and Portugal will make it possible to enhance the security of energy supply in those countries and hence in the Community as a whole.

29. Similarly, the development of gas interconnections between Member States will strengthen the security of supply as a result of greater system **flexibility** in the eventuality of an interruption of part of the natural gas supplies. The capacity of the system and storage, the routes followed and the interconnections, the holding and auxiliary installations and the existence of "interruptible" customers are the basic means of combating this situation. At the Community level, there are no technical obstacles to the interoperability of the interconnected transmission system on the basis of active cooperation between the various gas companies.

According to studies carried out by the Commission, the current emergency measures and those for the next few years should suffice to deal effectively for at least 9 months with an interruption in supplies from any outside source of imports for countries and regions connected to the European network. An increase in the level of security could be achieved by the establishment of a link between the United Kingdom and mainland Europe.

## B. The Community dimension

30. The further development of the natural gas transmission and storage infrastructures will essentially depend on the commercial and operational needs of the gas industry. However, given that the gas market is widely expanding, increased cooperation between operators of high pressure natural gas transmission networks and consultation at Community level will be necessary with a view to designing and operating the European system of terminals, gas pipelines and storage facilities.

In addition, the effective implementation of the directive on transit through natural gas transmission networks and, possibly, the proposed introduction of a form of third party access to networks depend on the existence of interconnections and enough suitable networks.

31. These prospects mean that access to natural gas must be promoted by introducing new networks and interconnections and that an attempt must be made, by means of qualitative improvements, to achieve optimum utilization of the gas infrastructures.

### (a) The development of interconnections

32. Large-scale gas projects are already underway or under study to **supplement the interconnections or establish new lines of penetration** (see Annex VII):

- A first series of developments is aimed at the establishment of natural gas in Member States and regions which do not so far have supplies at their disposal. These projects are as follows:

  . The introduction of natural gas into Portugal (scheduled for 1996).

  . Establishment of gas infrastructure in Greece (scheduled for 1994).

  . Natural gas supplies (under study) for Corsica and Sardinia on the basis of an interconnection with mainland Italy.

  . The extension of the Spanish internal network in several regions (Galicia, Valencia, Andalusia and Estremadura) in order to expand the share of the internal gas market.

  . The interconnexion between the Spanish network and the future Portuguese network.

. Three interconnection projects in Germany for the new Länder could be completed towards 1993-95. These concern a link between Lauterbach and Jena/Leipzig, a branch from the Emden-Ludwigshafen project and a connection close to the Salzwedel natural gas field.

- A second series of projects concerns the establishment of interconnections between Community Member States and the boosting of existing links, so as to open up new penetration routes which will improve the security of gas supplies, the diversification of suppliers and transit facilities:

  . An interconnection between France (Lacq) and Spain (Calahorra) will make it possible to supply Norwegian gas to Spain as from 1993.

  . A gas interconnection between Great Britain, Northern Ireland and Ireland is under study (scheduled for 1993).

  . The construction in Germany of new gas pipelines from Emden to Ludwigshafen and from Werne to Schluchtern will increase the carrying capacity of the present North-South link which is at saturation point.

  . Completion of the East-West gas pipeline in France from Etrez to Chemery via Nevers will provide greater flexibility in the utilization of North-South routes.

  . Completion of the "Zeepipe" project (scheduled for 1993) will open up a second penetration route via Zeebrugge for Norwegian gas destined for several Member States.

  . The third gas pipeline project from Norway to northern Germany (probably Emden) is also to be seen in conjunction with the supply of natural gas to the central and East European countries.

  . Other interconnection projects concerning the Member States in the North of Europe would seem to have to be further extended. These may include the possibility of linking the gas networks of Germany with those of Belgium and the Netherlands, that of the UK to the continent and interlinking those of Denmark and Norway (Scanpipe project or interconnection via Sweden).

Completion of these gas infrastructure and interconnection projects, some of which are already the subject of Commission proposals for financial support under the Structural Funds, will provide an additional measure of reliability and security of supply by raising the implementation of these concepts from national to Community level.

- A third series of projects concerns the development or boosting of gas interconnections between the South of Europe and North Africa and with the central and East European countries as well as with other potential supplying countries:

  . The Spain-Morocco interconnection project could provide, as from 1995, a direct access route for Algerian gas to the Iberian Peninsula and in the longer term towards new regions .
  . A fourth subsea gas pipeline between Tunisia and Italy (Transmed system) should come into service in 1993. This will make it possible to increase the share of Algerian gas in Italy and provide access to potential new markets in Europe.
  . Negotiations are taking place on the construction of a submarine gas pipeline between Italy and Libya.
  . Technical cooperation with the countries of central and Eastern Europe could lead to the development of interconnections for natural gas supply to these countries from Norway or Algeria. Cooperation with the CIS could lead to the development of infrastructures and the improvement of utilization and transmission conditions for natural gas, thereby improving the use of energy in the CIS and the security of supplies to the rest of Europe.
  . The possibilities of connections with the gas networks of the Middle East, with a view to bringing natural gas via Turkey and Northern Greece to Southern Italy, could also be examined ; this would give access to large reserves and would contribute to an increased diversification of the Community's sources of natural gas supply.

  The Commission's Europe 2000 document suggests that amongst these various projects priority should be given to increasing the capacity of the Transmed pipeline, the Spanish-Moroccan interconnection, the pipeline from France to Spain, the Greek and Portuguese networks, the pipelines between Ireland and the UK and across the North Sea and connections between West Germany and the new Länder.

(b) Improvements in the quality of the gas system

33. As is usual in a market economy, the Community's gas undertakings are free to negotiate and to decide their supply contracts. There are however cases where cooperation between gas undertakings may be useful, while observing the rules of competition, with a view to seeking the best conditions of supply. Coordination between gas companies in the Community has already taken place in the past, in particular in the grouped negotiation of new long-term supply contracts (in the form of variable-geometry consortia), with Norway for example, leading to the concerted building of penetration gas pipelines ("Zeepipe" project) and the boosting of

the internal networks to facilitate transit through several countries. At present, a group is being set up for the construction of the European part of the Algeria - Morocco - Spain - France gas pipeline.

In this context, the possibility for large consumers, together with other new buyers, to be associated with this process of cooperation will be examined.

34. At present, the European gas companies regularly carry out transactions between themselves which make it possible to achieve **savings on gas transmission** by limiting unnecessary, costly physical transfers over long distances.
This practice, together with the coordinated utilization of stocks and of the holding and auxiliary capacities of the networks, should be increased.

Progress can be made in this direction by the improvement of the **information exchange** between the centres of control showing the degree of capacity use of the main gas transmission and storage infrastructures. This system should lead to the progressive establishment of a true **operational cooperation at technical level** between the European gas transmission networks, taking full advantage of the interconnected system dimension. This coordination is limited to a level of technical cooperation compatible with the rules of competition.

Consideration should also be given to the possibility of **renting underground storage** sites to other gas companies in the Community, taking account of the unequal distribution among Member States of geological sites suitable for this type of storage.

35. In order to increase the security of gas supply at the Community level, thought should be given to the **possibility of improving the mutual assistance arrangements** set up by the gas companies to deal with a total or partial interruption of imports in one or more Member States. A first step might be to catalogue the major European natural gas transmission **routes** which, from this viewpoint, are of strategic value and to identify any **technical obstacles** such as the saturation of sections of networks or the inadequate capacity of certain facilities. The findings should serve as a basis for preparing Community responses to any transit problems and to increasing the security of supply as a whole.

## IV. FEATURES COMMON TO ELECTRICITY AND NATURAL GAS

### A. Authorization procedures

36. Experience in carrying out energy transmission infrastructure and interconnection projects shows that long periods of time are involved which lead to delays or impasses which sometimes jeopardize their completion(7). Periods of 10 to 15 years are not uncommon in the electricity sector. It is difficult to reconcile these time scales with the rapid changes in requirements which will follow from the completion of the internal market. Environmental protection considerations and local opposition, in particular, lead in some cases to projects being abandoned or to alternative solutions the viability of which is more debatable. The gas sector also is affected by these problems, but to a lesser extent.

37. At present, some interconnections and parts of the electricity networks are close to saturation point, while the liberalisation of the market will bring an increase in trade and hence an increased need for electricity transmission capacities. Similarly for natural gas, the increase expected from consumption and penetration into new areas, combined with the liberalisation of the market, will require transmission capacities to be strengthened. "Missing links" in future infrastructures for gas and electricity could result from delays and difficulties associated with authorisation procedures. This situation would affect economic development and Community cohesion and slow down the changes required to take account of the Community dimension.

38. A detailed study of the situation in the Community should be carried out on the basis of a **survey of the authorization procedures** in the various Member States. The results will be evaluated particularly in the light of the existing environment protection rules and programmes. This should lead to some solutions allowing a better integration of energy investments in the environment.

(7) There is a similar problem as regards authorization and lead-in times for the construction of electric power stations.

## B. The granting of a Declaration of European Interest

39. The advantage of a Declaration of European Interest for certain major infrastructure projects has been emphasized by business circles and, in particular, the banks.

The application of a **Declaration of European Interest in the energy sector** will speed up the implementation of infrastructure projects for electricity and natural gas transmission by including a political commitment on the part of the public authorities, a commitment which might in particular attract private investment. It was in this spirit that the Commission recently sent Council a draft regulation on the declaration of European interest(8). Such a declaration would imply recognition that the carrying out of a project was within the Council guidelines (Art. 129 C of the Maastricht Treaty) and at the same time it would express the will of the Community institutions to promote and to facilitate the achievement of a project which was in conformity with those guidelines. Of course a declaration would not create a right to obtain financing from the Commission.

## C. Financial support from the Community

40. At present, **Community assistance** for energy infrastructures, which should normally be financed in accordance with the market rules, consists for the most part of aid granted by the European Regional Development Fund and loans granted by the European Investment Bank. In 1988 ERDF support amounted to 251 million ECU and EIB loans to 1500 million ECU. However, aid from the Structural Funds to the sector has increased markedly and, as noted above, commitments should exceed 2000 million ECU between 1989 and 1993.

41. In the future, in addition to the Structural Funds, the Maastricht Treaty (Art. 129 C) will allow the Community to support the financial efforts of Member States for projects of common interest identified within the framework of guidelines set at European level, in particular by means of feasibility studies, loan guarantees or interest rate subsidies. Community action will take the form of guidance and scene-setting ; any financial assistance will be subsidiary and such as to encourage the achievement of a project of common interest. In the realm of energy, this is important, above all so as to promote feasibility studies for such projects. It would also be desirable for this financial support to stimulate technical studies covering the development and management of the interconnected system for electricity and

(8) COM (92) 15 of 3.2.1992.

natural gas transmission and, in particular, the creation by the industry of new study, stimulation and operational tools will facilitate the emergence of a more Community-based approach.

42. The Commission adopted on 12 February 1992 the document "From the Single Act to Maastricht and beyond, the means to match our ambitions" (COM (92) 2000), which sets out the main financial guidelines for the Community 1993-97. In the accompanying document, COM(92) 2001, trans-European networks were considered as a whole. Figures for the energy sector will be given in the context of the annual budgetary procedures.

## D. Coordination

43. The Maastricht Treaty (Art. 129 C, point 2) provides that "Member States shall, in liaison with the Commission, coordinate among themselves the policies pursued at national level which may have a significant impact on the achievement of these objectives...". It also provides that the Commission shall have a role in promoting such coordination. Such coordination is necessary because the design and implementation of energy transmission infrastructures adapted to the Community dimension, itself placed within a continental perspective, does not consist of the juxtaposition of national approaches. The identification and the taking into account of the Community dimension may be greatly facilitated by the creation of an appropriate consultation framework, without limiting the right of the economic bodies to initiate their investments.

This coordination, which has also been called for by industry and banks, was also recommended by the Commission in its preliminary document on Europe 2000[9] and welcomed by the informal meeting of Ministers for regional policy.

The Commission will pursue the examination of this question with the Member States in order to put this coordination in hand.

(9) COM (90) 544 of the 16.11.1990.

## V. CONCLUSION

44. The matter for discussion presented in this communication represents a point of departure for the guidelines which the Community is bound to set out under the Treaty on European Union (Title XII).

Future work will have regard to:

- the respective roles of the Community and the Member States in the various types of activity outlined above;

- the priorities which emerge from the need to ensure all the Community's regions can benefit from the single market;

- the need for a coherent approach between the Community's Structural Funds and support given in the context of trans-European networks;

- whether current plans will leave important gaps in the networks.

The Commission will at a later date present its proposal for the adoption by the Community of those guidelines.

The Commission sends this document to the European Parliament and the Council asking them to take note of the analysis and the approach it contains.

* * *

ANNEX I - map

# MAIN ELECTRICITY TRANSMISSION NETWORK OF THE EUROPEAN COUNTRIES IN 1990

MAIN INTERCONNECTION PROJECTS PLANNED

01 Chaffard-Grand'Ile (F)-Piossasco (I)
02 Gorlago (I)-Robbia (CH)
03 Turbigo (I)-Airolo (CH)
04 Sandrigo (I)-Lienz (A)
05 (I) - (TN)
06 Laghi Alimini (I)-Arachtos (GR)
07 Thessalonique (GR)-Hamidabad (TR)
08 Aragon (E)-Cazaril (F)
09 Génissiat (F)-Cornier (F)
10 Sierentz (F)-Lachmatt (CH)
11 Bois Tollot (F)-Romanel (CH)
12 Sierentz (F)-(D)
13 Cattenom (F)-(D)
14 Charleville-Mézières (F)-(B)
15 Moulaine (F)-Aubange (B)
16 R.Ave-Lindoso (P)-Castrelo-Meson (E)
17 Recarei (P)-Aldeadavila (E)
18 (E)-Gibraltar-(MA)
19 Diele (D)-Meeden (NL)
20 Lathen (D)-Musselkanaal (NL)
21 (D) - West Berlin (D)
22 (D) - Eastern Germany (D)
23 Etzenricht (D)-Hradec (CS)
24 Isar (D)-St Peter (A)
25 Zealand (DK) - (D)
26 Hengelo (NL)-Dodewaard (NL)
Hessenweg (NL)-Meeden (NL)
Meeden (NL)-Eems (NL)
27 (IRL) - (GB)

380 kV TRANSMISSION LINES

IN SERVICE

PLANNED

Source : Directorate-General for Energy

ANNEX II

# ELECTRICITY CONSUMPTION AND EXCHANGES IN THE EUROPEAN COMMUNITY COUNTRIES
## (Tentative forecasts for the year 2000)

0

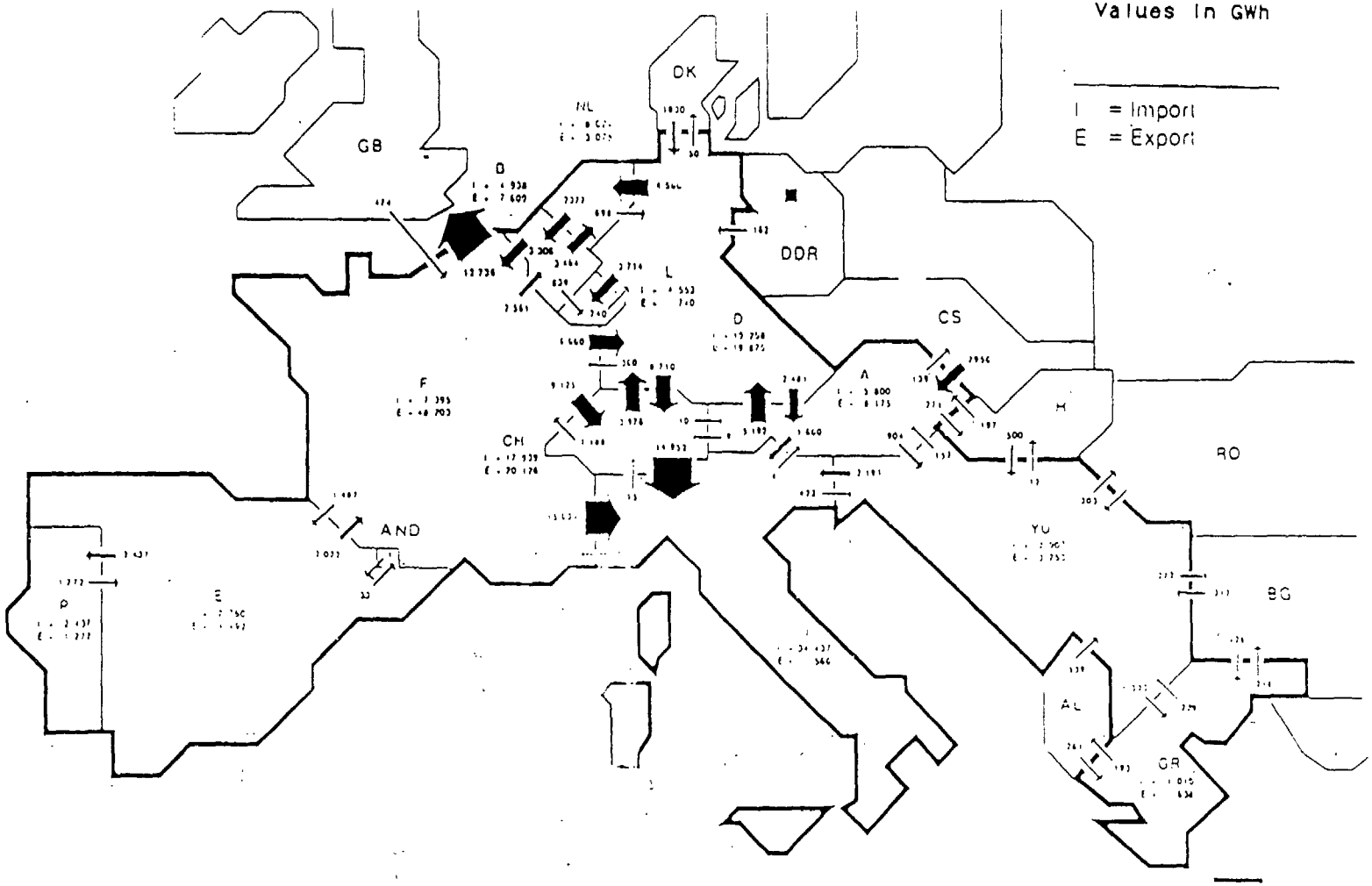
| TWH | | CONSUMPTION AVAILABLE FOR INTERNAL MARKET | IMPORTS (+) | EXPORTS (-) | BALANCE OF EXCHANGES | IMPORTS/CONS. AVAILABLE FOR INTERNAL MARKET (%) | EXPORTS/CONS. AVAILABLE FOR INTERNAL MARKET (%) | BALANCE EXCH./ CONS. AVAILABLE FOR INTERNAL MARKET (%) |
|---|---|---|---|---|---|---|---|---|
| BELGIUM | 1980 | 47,6 | 6,3 | 8,9 | - 2,6 | 13,2 | 18,6 | (-) 5,4 |
| | 1989 | 60,5 | 5,0 | 7,6 | - 2,6 | 8,2 | 12,5 | (-) 4,3 |
| | 2000 | 81,4 | 3,5 | 1,0 | + 2,5 | 4,3 | 1,3 | (+) 3,0 |
| DENMARK | 1980 | 24,3 | 1,9 | 3,1 | - 1,2 | 7,8 | 12,8 | (-) 4,9 |
| | 1989 | 30,9 | 11,6 | 2,2 | + 9,4 | 37,5 | 7,1 | (+) 30,4 |
| | 2000 | 38,1 | 3,1 | 2,6 | + 0,5 | 8,1 | 6,8 | (+) 1,3 |
| GERMANY | 1980 | 351,5 | 19,2 | 13,5 | + 5,7 | 5,4 | 3,8 | (+) 1,6 |
| | 1989 | 407,2 | 21,0 | 21,5 | - 0,5 | 5,1 | 5,2 | (-) 0,1 |
| | 2000 | 480,5 | 25,0 | 15,0 | + 10,0 | 5,2 | 3,2 | (+) 2,0 |
| GREECE | 1980 | 21,9 | 0,6 | 0,0 | + 0,6 | 2,7 | 0,0 | (+) 2,7 |
| | 1989 | 31,5 | 1,0 | 0,6 | + 0,4 | 3,1 | 1,9 | (+) 1,2 |
| | 2000 | 48,1 | 1,5 | 0,0 | + 1,5 | 3,1 | 0,0 | (+) 3,1 |
| SPAIN | 1980 | 102,0 | 2,3 | 3,7 | - 1,4 | 2,2 | 3,6 | (-) 1,4 |
| | 1989 | 136,5 | 2,8 | 4,6 | - 1,8 | 2,0 | 3,3 | (-) 1,3 |
| | 2000 | 175,2 | 3,0 | 5,0 | - 2,0 | 1,7 | 2,8 | (-) 1,1 |
| FRANCE | 1980 | 248,8 | 15,6 | 12,5 | + 3,1 | 6,3 | 5,1 | (+) 1,2 |
| | 1989 | 340,5 | 7,8 | 50,2 | - 42,4 | 2,3 | 14,7 | (-) 12,4 |
| | 2000 | 472,5 | 4,0 | 65,0 | - 61,0 | 0,8 | 13,7 | (-) 12,9 |
| IRELAND | 1980 | 9,7 | - | - | - | - | - | - |
| | 1989 | 12,6 | - | - | - | - | - | - |
| | •2000 | 17,7 | - | - | - | - | - | - |
| ITALY | 1980 | 179,1 | 8,0 | 2,0 | + 6,0 | 4,4 | 1,1 | (+) 3,3 |
| | 1989 | 229,2 | 34,4 | 0,7 | + 33,7 | 15,0 | 0,3 | (+) 14,7 |
| | 2000 | 309,1 | 35,1 | 1,5 | + 33,6 | 11,3 | 0,4 | (+) 10,9 |
| LUXEMBOURG | 1980 | 3,6 | 3,0 | 0,2 | + 2,8 | 83,3 | 5,5 | (+) 77,7 |
| | 1989 | 4,1 | 4,6 | 0,8 | + 3,8 | 112,1 | 19,5 | (+) 92,6 |
| | 2000 | 5,9 | 5,4 | 0,2 | + 5,2 | 91,5 | 3,4 | (+) 88,1 |
| NETHERLANDS | 1980 | 61,7 | 3,9 | 4,2 | - 0,3 | 6,3 | 6,8 | (-) 0,5 |
| | 1989 | 75,6 | 5,3 | 0,3 | + 5,0 | 7,0 | 0,4 | (+) 6,6 |
| | 2000 | 91,0 | 12,0 | 0,0 | + 12,0 | 13,2 | 0,0 | (+) 13,2 |
| PORTUGAL | 1980 | 16,5 | 2,3 | 0,5 | + 1,8 | 13,9 | 3,0 | (+) 10,9 |
| | 1989 | 25,0 | 2,4 | 1,3 | + 1,1 | 9,6 | 5,2 | (+) 4,4 |
| | 2000 | 38,0 | 6,0 | 1,0 | + 5,0 | 15,7 | 2,6 | (+) 13,1 |
| UK | 1980 | 264,8 | 0,0 | 0,0 | - | 0,0 | 0,0 | - |
| | 1989 | 302,2 | 13,6 | 0,9 | + 12,7 | 4,5 | 0,3 | (+) 4,2 |
| | 2000 | 382,0 | 12,5 | 0,0 | + 12,5 | 3,3 | 0,0 | (+) 3,3 |
| EUROPE 12 | 1980 | 1335,4 | 63,4 | 48,7 | + 14,7 | 4,7 | 3,6 | (+) 1,1 |
| | 1989 | 1656,0 | 109,7 | 90,8 | + 18,9 | 6,6 | 5,5 | (+) 1,1 |
| | 2000 | 2139,5 | 111,10 | 91,4 | + 19,7 | 5,2 | 4,3 | (+) 0,9 |

•The situation will be different if the UK-Ireland electricity link is completed by the year 2000.

Source: Eurostat - 1980, 1989.

Energy in Europe, Energy for a new century : The European perspective, Special issue, CEC-DG for Energy, July 1990.
Tentative forecasts for the year 2000 according to scenario 1 - "Conventional Wisdom".

ANNEX III - Physical movements of energy in 1989.




Source : UCPTE 1989

ANNEX IV

## TOWARDS A TRANS-EUROPEAN ELECTRICITY NETWORK

### Main interconnection projects planned

380 kV lines

| N° | COUNTRY | POINTS TO BE LINKED | NOMINAL POWER (MVA) | PROGRESS MADE | PROB. DATE OF ENTRY INTO SERVICE |
|---|---|---|---|---|---|
| 1 | ITALY – FRANCE | Piossasco (I) – Chaffard – Grand'Ile (F) | 3.000 | Feasibility study completed | 1995 |
| 2 | ITALY – SWITZERLAND | Gorlago – Robbia | 3.000 | Feasibility study completed | 1994 |
| 3 | ITALY – SWITZERLAND | Turbigo – Airolo | 3.000 | Feasibility study completed | 1996 |
| 4 | ITALY – AUSTRIA | Sandrigo – Lienz | 3.000 | Feasibility study completed | 1996 |
| 5 | ITALY – TUNISIA | Sicily – Cap Bon | (1.500) | Project planned | |
| 6 | ITALY – GREECE | Galatina – Aractos | 600 | Feasibility study completed | 1997 |
| 7 | GREECE – TURKEY | Thessalonique – Hamidabad | 600 | Project planned | 1994–95 |
| 8 | FRANCE – SPAIN | Cazaril – Aragon | 2.500 | Construction deferred | end 1994 |
| 9 | FRANCE | Génissiat – Cornier and 400/225 kV station at Cornier | 3.700 | Feasibility study completed | 1992 |
| 10 | FRANCE – SWITZERLAND | Sierentz – Lachmatt | 1.250 | Feasibility study completed | 1993 |
| 11 | FRANCE – SWITZERLAND | Bois Tollot – Romanel | 3.000 | Feasibility study completed | 1992 |
| 12 | FRANCE – GERMANY | Sierentz – German network | | Project planned | |
| 13 | FRANCE – GERMANY | Cattenom – German network | 3.700 | Project planned | |
| 14 | FRANCE – BELGIUM | Charleville/ Mézières – (B) | | Project under study | |

| | | | | | |
|---|---|---|---|---|---|
| 15 | FRANCE – BELGIUM | Moulaine – Aubange | 1.420 | Feasibility study in progress | 1992 |
| 16 | PORTUGAL – SPAIN | R.d'Ave–Lindoso (P)– Cartelle – Meson (E) | 1.250 | Construction | 1993 |
| 17 | PORTUGAL – SPAIN | Recarei – Aldeadavila | 1.000 | Studies | – |
| 18 | SPAIN – MOROCCO | Subsea cable across Strait of Gibraltar | 600 | Feas. studies completed | 1995 |
| 19 | GERMANY – NETHERLANDS | Diele – Meeden | 3.400 | Planned | After 1995 |
| 20 | GERMANY – NETHERLANDS | Lathen – Musselkanaal | | Probable boosting of existing line | |
| 21 | GERMANY | Helmstedt – Wolmirsted West Berlin | | | |
| 22 | GERMANY | Networks in Germany (East – West) | | | 1993 or 1994 |
| 23 | GERMANY – CZECHOSLOVAKIA | Etzenricht – Hradec | 1.400 | Construction | 1992 |
| 24 | GERMANY – AUSTRIA | Isar – St Peter | | Scheduled for the long term | |
| 25 | DENMARK – GERMANY | (Zealand – Germany) | 350 – 1.000 | Feasibility study in progress | |
| 26 | NETHERLANDS | Hengelo – Dodewaard<br>Hessenweg – Meeden<br>Meeden – Ems | 3.400<br>5.000<br>5.000 | Construction<br>administration<br>procedures in progress | 1992<br>1995<br>1996 |
| 27 | IRELAND – UK | Gr. Island – Pembroke power station in Wales via Wexford<br>ou<br>Gr. Island – Anglesea (Wales) | 600 | Feasibility studies completed in 1986 – review necessary | 1998 |

Other projects are planned by the Member States to enable the national networks to be better incorporated in a more fully interconnected Community network:

- in France : strengthening of the national networks in the Lille area
- in Greece : – construction of an AC/DC/AC converter station in northern Greece (500 MW) for interconnection with Bulgaria
  – establishment of a national electricity production and transmission control system – feasibility study completed – scheduled date for entry into service: 1992

# MAIN NATURAL GAS TRANSMISSION NETWORK OF THE EUROPEAN COUNTRIES IN 1990

GAS PIPELINES

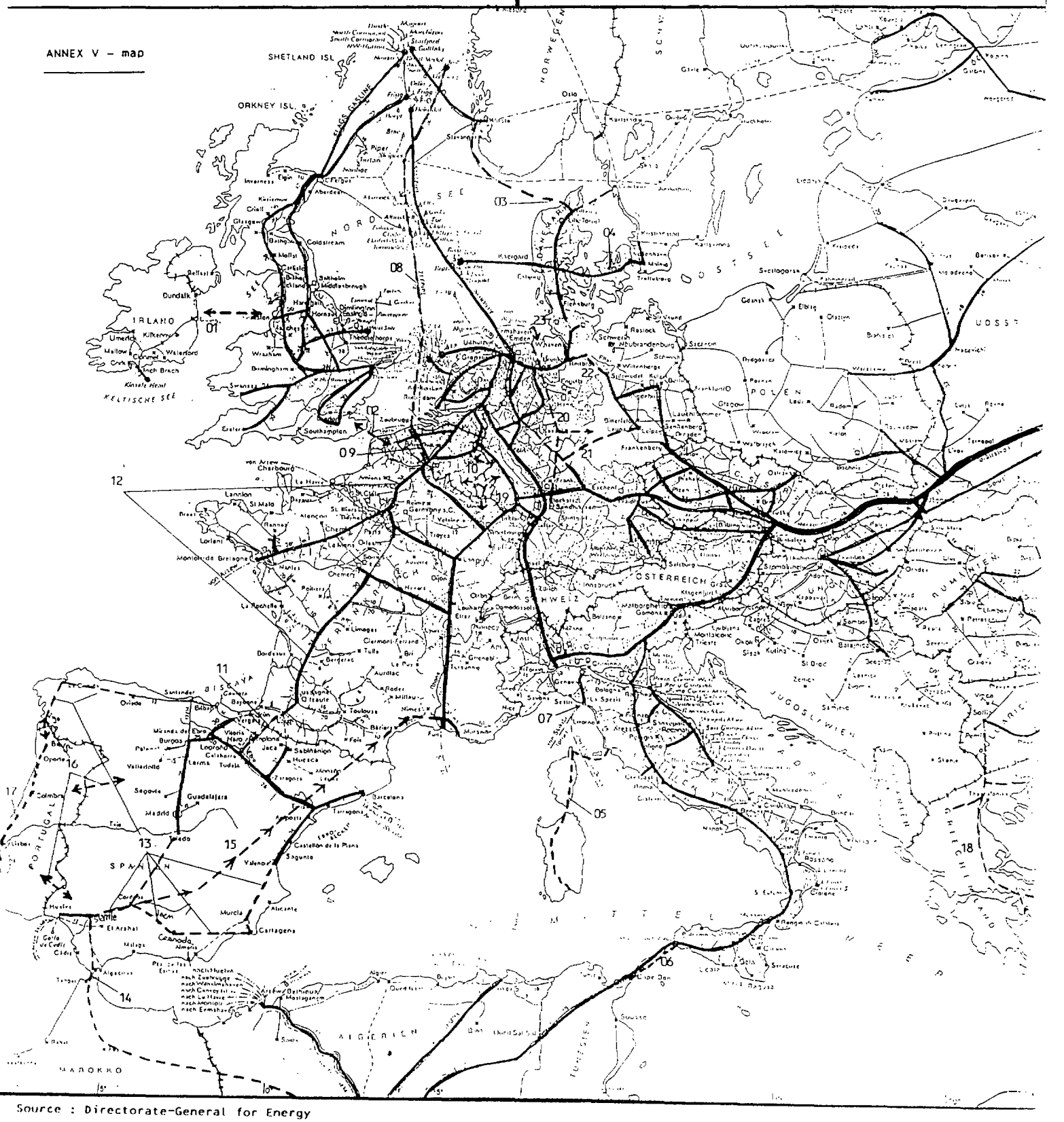
———— IN SERVICE, DIAMETER > 24"

- - - - - - - - PLANNED

MAIN INTERCONNECTION AND EXTENSION PROJECTS PLANNED

| | | | |
|---|---|---|---|
| 01 | UK - Ireland | 13 | Spain |
| 02 | UK - Continent | 14 | Spain - Morocco |
| 03 | Norway - Denmark - Sweden | 15 | Spain - France |
| 04 | Denmark/Sweden | 16 | Spain - Portugal |
| 05 | Italy - France | 17 | Portugal |
| 06 | Italy - Tunisia | 18 | Greece |
| 07 | Italy | 19 | Luxembourg |
| 08 | Norway - Continent | 20 | Germany |
| 09 | Belgium - France | 21 | Germany |
| 10 | Belgium - Germany | 22 | Germany |
| 11 | France - Spain | 23 | Germany |
| 12 | France | | |

ANNEX V - map




Source : Directorate-General for Energy

ANNEX VI

# PROFILE OF THE NATURAL GAS MARKET IN THE EUROPEAN COMMUNITY COUNTRIES (tentative forecasts for the year 2000)

(million toe)

| COUNTRY | | GROSS INLAND CONSUMPTION | PRODUCTION | INTRA-COMMUNITY IMPORT-EXPORT | IMPORTS FROM OUTSIDE THE COMMUNITY | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | TOTAL | ALGERIA | NORWAY | USSR | OTHERS | % OF CONSUMP |
| BELGIUM | 1980 | 8,9 | – | 7,1 | 1,8 | – | 1,8 | – | – | 20,2 |
| | 1989 | 8,0 | – | 2,9 | 5,1 | 3,3 | 1,8 | – | – | 63,8 |
| | 2000 | 11,0 | – | 3,0 | 8,1 | 5,6 | 2,5 | – | – | 73,6 |
| DENMARK | 1980 | – | – | – | – | – | – | – | – | – |
| | 1989 | 1,5 | 2,5 | −0,4 | – | – | – | – | – | – |
| | 2000 | 3,0 | 4,0 | −1,0 | (•) | – | (•) | – | – | – |
| GERMANY | 1980 | 44,7 | 14,3 | 17,0 | 15,5 | – | 7,2 | 8,3 | – | 34,7 |
| | 1989 | 45,6 | 11,5 | 13,8 | 22,5 | – | 7,4 | 15,1 | – | 49,3 |
| | 2000 | 53,8 | 11,9 | 12,0 | 29,8 | 1,8 | 10,0 | 18,0 | – | 55,4 |
| SPAIN | 1980 | 1,7 | – | – | 1,7 | 1,2 | – | – | 0,5 | 100,0 |
| | 1989 | 4,7 | 1,4 | – | 3,4 | 2,2 | – | – | 1,2 | 72,3 |
| | 2000 | 5,7 | 1,5 | – | 4,2 | 2,2 | 1,0 | – | 1,0 | 73,7 |
| FRANCE | 1980 | 21,5 | 6,3 | 7,7 | 8,4 | 1,9 | 2,4 | 4,1 | – | 39,0 |
| | 1989 | 24,3 | 2,3 | 2,5 | 19,8 | 7,8 | 5,0 | 7,0 | – | 81,5 |
| | 2000 | 33,7 | 1,0 | 1,7 | 31,0 | 13,0 | 7,0 | 11,0 | – | 92,0 |
| GREECE | 1980 | – | – | – | – | – | – | – | – | – |
| | 1989 | 0,1 | 0,1 | – | – | – | – | – | – | – |
| | 2000 | 2,0 | – | – | 2,0 | 0,5 | – | 1,5 | – | 100,0 |
| IRELAND | 1980 | 0,7 | 0,7 | – | – | – | – | – | – | – |
| | 1989 | 1,9 | 1,9 | – | – | – | – | – | – | – |
| | 2000 | 2,1 | 1,5 | 0,6 | – | – | – | – | – | – |
| ITALY | 1980 | 22,7 | 10,2 | 5,5 | 6,3 | – | – | 5,2 | 1,1 | 27,7 |
| | 1989 | 36,1 | 13,2 | 4,7 | 18,7 | 8,9 | – | 9,6 | 0,2 | 51,2 |
| | 2000 | 45,2 | 16,5 | 2,7 | 26,0 | 12,5 | – | 13,3 | 0,2 | 57,5 |
| LUXEMBOURG | 1980 | 0,4 | – | 0,4 | – | – | – | – | – | – |
| | 1989 | 0,4 | – | 0,4 | – | – | – | – | – | – |
| | 2000 | 0,5 | – | 0,5 | – | – | – | – | – | – |
| NETHERLANDS | 1980 | 30,4 | 66,7 | −37,7 | 2,8 | – | 2,8 | – | – | 9,2 |
| | 1989 | 31,1 | 54,1 | −23,9 | 2,1 | – | 2,1 | – | – | 6,8 |
| | 2000 | 32,9 | 48,8 | −18,9 | 3,0 | – | 3,0 | – | – | 9,0 |
| PORTUGAL | 1980 | – | – | – | – | – | – | – | – | – |
| | 1989 | – | – | – | – | – | – | – | – | – |
| | 2000 | 1,2 | – | – | 1,3 | 1,3 | – | – | – | 100,0 |
| UK | 1980 | 39,9 | 30,9 | – | 9,0 | – | 9,0 | – | – | 22,5 |
| | 1989 | 45,2 | 36,3 | – | 8,9 | 0,1 | 8,8 | – | – | 19,7 |
| | 2000 | 58,0 | 50,0 | −0,6 | 8,6 | 0,1 | 8,5 | – | – | 13,8 |
| EUROPE 12 | 1980 | 171,0 | 129,3 | ∅ | 45,5 | 3,1 | 23,2 | 17,6 | 1,6 | 26,6 |
| | 1989 | 198,9 | 123,3 | ∅ | 80,5 | 22,3 | 25,1 | 31,7 | 1,4 | 40,5 |
| | 2000 | 249,3 | 135,3 | ∅ | 114,0 | 37,0 | 32,0 | 43,8 | 1,2 | 45,7 |

(•) According to DANGAS forecasts Denmark will import about 1 x $10^6$ toe of Norwegian gas intended for the Swedish market.

Source : EUROSTAT – 1980, 1989.
ENERGY IN EUROPE , Energy for a new century : The European perspective , Special Issue, CEC-DG for Energy, July 1990 – Indicative forecasts for the year 2000 in accordance with scenario 1 – "Conventional Wisdom".

## ANNEX VII

## TOWARDS A TRANS-EUROPEAN NATURAL GAS NETWORK

### Main interconnection and extension projects planned

| REGION(S) CONCERNED | PROBABLE DATE OF ENTRY INTO SERVICE | COMMENTS |
|---|---|---|
| 1. UK - IRELAND | End of 1993 | Route:<br>. Scotland - Dublin, with a branch to Belfast<br>(The option of importing LNG is also being considered). |
| 2. UK - Continent | | A link with the ZEEPIPE gas pipeline could be considered. |
| 3. NORWAY/DENMARK/SWEDEN | 1995 | DANGAS, SwedeGas and Statoil are considering the possibility of constructing SCANPIPE to bring Norwegian gas from the south-west coast of Norway via the northern Danish network to the west coast of Sweden (Göteborg). |
| 4. DENMARK/SWEDEN | End of 1994 | DANGAS and SwedeGas are jointly to develop storage facilities, with a capacity of about 300 million $m^3$, at Stenlille in Denmark. |
| 5. ITALY - FRANCE | not yet decided | Gas pipeline Italy - Corsica - Sardinia. |
| 6. ITALY - TUNISIA | 1993 | Laying of fourth gas pipeline planned.<br>A fifth line is currently being considered. |
| 7. ITALY | | Extension of the LNG terminal at Panigaglia (La Spezia). |
| 8. NORWAY - CONTINENT | early 1993 | The ZEEPIPE gas pipeline will bring natural gas from the Troll and Sleipner gas fields to Zeebrugge in Belgium. |

| REGION(S) CONCERNED | PROBABLE DATE OF ENTRY INTO SERVICE | COMMENTS |
|---|---|---|
| 9. BELGIUM – FRANCE | 1993 | Extension of the Belgian gas network to bring Norwegian gas to France and other Community countries by laying an additional gas pipeline between Brugge and Quévy. |
| 10. BELGIUM – GERMANY | | A link would be considered between Belgium and Germany if the latter decided to import LNG via Zeebrugge. |
| 11. FRANCE – SPAIN | Oct. 1993 | Link from Lacq (France) to Calahorra (near Pamplone/Spain)/ interconnection of French and Spanish gas networks which will enable Norwegian natural gas to be brought to the Iberian peninsula. |
| 12. FRANCE | | Extension of the French gas network as a result of projects 9 and 11. |
| 13. SPAIN | | To extend the Spanish gas network to bring natural gas to new regions and to enable Norwegian gas to be imported. |
| Valencia – Orihuela | end 1994 | It is also planned to reorganise the LNG station at Barcelona and to reinforce the terminal at Huelva. |
| Orihuela – Cartagena<br>Cordoba – Jaén – Granada | 1st quarter 1995 | |
| Oviedo–La Coruña–Vigo | 1994 | An LNG station is planned near La Coruña. |
| 14. SPAIN – MOROCCO | 1995 | A project to bring Algerian gas by pipeline to Spain. |

| REGION(S) CONCERNED | PROBABLE DATE OF ENTRY INTO SERVICE | COMMENTS |
|---|---|---|
| 15. SPAIN – FRANCE | after 2000 | Link from Seville to Southern France to enable Algerian natural gas to be brought to France and other European countries. |
| 16. SPAIN – PORTUGAL | | Possible links: Seville – Setubal, Vigo – Porto, Burgos – Coimbra, Ciudad Real – Setubal. |
| 17. PORTUGAL | 1996 | Setubal – Braga gas pipeline and LNG station at Setubal. |
| 18. GREECE | 1994 | Gas pipeline from the Greek–Bulgarian frontier to Athens. LNG station at Revithoussa near Athens. |
| 19. LUXEMBOURG | | Three projects are planned: a new line to Belgium (Fourons), connection to the German network (via the Saarland or boosting the link with France. Only one of these three projects will be implemented. |
| 20. GERMANY | | New gas pipeline from Emden to Ludwigshafen (Midal project of Wintershall) with possible extensions to eastern Germany and the south (Austria). |
| 21. GERMANY | end 1992 | Ruhrgas project: interconnection of two gas pipelines (USSR gas network and Ruhr network) and link-up with the eastern German network (gas pipeline from Lauterbachen to Leipzig). |
| 22. GERMANY | | Project to interconnect the western and the eastern German networks near Salzwedel. |
| 23. GERMANY | | The construction of an LNG station at Wilhemshafen has been planned but the project is currently frozen. |