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**EUROPE-ASIA
CO-OPERATION STRATEGY
FOR ENERGY**

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SUMMARY

Due to the demographic and economic growth taking place in Asia, the demand for energy could double between now and 2005. This growth will have repercussions for Europe in three areas : on security of supply (Europe will be dependent on the outside world for 55% of its requirements in 2005 and 75% in 2015), on the European energy industry (Asia already represents half the world market) and on the global environment (protective measures implemented in Europe will have only limited effect unless action is taken simultaneously in Asia).

The energy sector therefore deserves special attention in the context of relations between Europe and Asia, so it is worthwhile to work out a strategy for co-operation in this area. This new strategy is all the more necessary since the co-operation activities currently being carried out by the Community, the Member States and other providers of capital are yielding useful but only partial solutions to the challenges facing the sector in Asia.

Working within the framework of the new Asian strategy on the one hand and current considerations about a European energy policy on the other, there are three objectives which need to be considered in respect of energy co-operation between Europe and Asia : strengthening the security of supplies of Asia and Europe, participating in Asia's energy markets and protecting the global environment.

More specifically, Community co-operation will aim to establish a dialogue in the area of energy policy and will help to mobilise the private sector (which is being asked to play an increasingly important part because of the amounts of money involved), while preserving the long-term public interest by taking into account the social and environmental aspects of energy development. These actions will at one and the same time affect energy supply, through optimal development of local resources, and also demand, through consumption management.

Community activities will be selected according to the criteria of mutual interest, subsidiarity - taking into account the activities of Member States - synergy with other international donors and lending agencies and considerations of sustainability.

Given this approach, priority will be given to the electricity, natural gas and coal sectors, energy efficiency and the energy supply of rural areas in particular by an increased use of new/renewable energies.

The implementation of this strategy will first require the creation of an on-going dialogue on energy policies with the Asian authorities. Depending on specific geographical factors and on selected sectoral priorities, the Community will intervene progressively on several different levels : information on European solutions, adaptation of institutional frameworks and also assistance to companies and energy operators. With this aim, it is necessary to consolidate the Community instruments already established and to target existing resources.

INTRODUCTION

Because of the economic and political importance of Asia, the European Union, at the European Council meeting held at Essen from 8 to 10 December 1994, confirmed its intention to strengthen co-operation and dialogue with countries and organisations of the region. The Council invited the Commission to propose concrete initiatives to this effect, within the framework of the new Asia strategy.

In addition, the White Paper entitled "*An Energy Policy for the European Union* " introduced by the Commission in December 1995, underlines the importance of developing international relations in the field of energy and recommends the elaboration of an Asia energy sector strategy.

This strategy, the subject of the Communication, is presented within the framework of policy options already established both at the geographical and sectoral levels. The first section highlights the main problems facing the Asian energy sector and the related issues for Europe, as well as the existing international co-operation frameworks. The main features of a new Community co-operation strategy include three complementary objectives, plus priority sectors, selection criteria and guidelines for a future action plan. These are described in the second section of the Communication.

Part I. BACKGROUND

1. THE ENERGY SECTOR IN ASIA, FUTURE CHALLENGES AND HIGH STAKES FOR EUROPE

1.1. A wide diversity of socio-economic conditions

Asia now has a population of some 3 billion inhabitants and it is undergoing a process of rapid urbanisation. The countries under consideration¹ here, mostly developing countries, generated a Gross National Product (GNP) of more than 1500 billion dollars in 1994. Nevertheless, the average annual income per inhabitant in these countries varies between less than 150 ECU and more than 12,000 ECU, which indicates a wide range of economic and social contexts (*Annex 1*). These imbalances are also reflected in the energy sector, with some countries such as Bhutan and Nepal consuming the equivalent of less than 20 kg of oil per capita each year, while others such as China, Thailand, Malaysia and Singapore consume more than 600 kg of oil equivalent per capita, compared with 4000 kg for Europe and about 8000 kg for USA. The proportion of households supplied with electricity varies from less than 15% in some countries to almost 100% in others. In today's Asia more than a billion people exclusively use either wood or vegetable or animal waste as their principal source of energy for cooking and heating.

1.2. High growth rates

The economies of most of these Asian countries have GNP figures which are growing at some of the highest rates in the world (almost 10% per year, or more in some cases). The Asian region is therefore becoming a prominent market, with half the human race and more than a billion consumers who will have significant buying power by the year 2000.

In 1995, the total annual consumption of primary energy in Asia will be equivalent to just over 1.7 billion tonnes of oil, which is already 1.3 times the total consumption in the European Union, without counting Japan, which consumes 0.45 billion tonnes of oil equivalent by itself. However, according to the predictions of the World Bank and the Asian Development Bank, this figure could double between 1990 and 2005, with oil products levelling off, coal accounting for a larger share and a rapid increase in the use of electricity and natural gas. Hence in 2005, Asia could be consuming 28% of the world's energy, Europe 13%, Latin America 6% and the countries of the Mediterranean and the Middle East 5% (*Annex 2*).

The electricity sector should grow more rapidly still with an installed capacity tripling from 250 GW in 1992 to about 750 GW by 2005, an increase which is equivalent to the total installed capacity in the European Union in 1993. This will involve almost 400 billion ECU in investment during that period.

Natural gas is also expected to grow very rapidly (at a rate of more than 10% per year), with a considerable increase in proven reserves and implementation of major national and regional production, transport and distribution programmes.

¹Countries presently benefiting from Community cooperation: Afghanistan, Bangladesh, Bhutan, Brunei, Cambodia, China, India, Indonesia, Laos, Malaysia, Maldives, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam.

1.3. A new energy crisis

The explosion of the energy demand in Asia, caused by this very rapid economic growth, is unfortunately being confronted with energy production capacities which are often inadequate. Major energy losses whether at production, transmission, distribution or end-user's stage contribute to exacerbating those difficulties.

These imbalances between energy supply and demand are causing very severe economic and social disturbances in many countries in the region, both in cities and in rural areas. The virtually permanent electrical load-shedding which takes place in China, India, Indonesia and the Philippines has had particularly negative effects in recent years, costing more than 1% of GNP in some cases. Losses of electricity due to both technical and non-technical reasons exceed 20% in many countries in the region, compared with less than 12% in Europe.

The explosion in the demand for the transportation of both people and goods is also causing, and may be expected to continue to cause, a very high rate of growth in the demand for oil products resulting in particular from, on the one hand, increased demand for private vehicles, and on the other, increased transport of goods by road. Furthermore, in most Asian countries this growth may be expected to be more rapid than the growth of the economy as a whole. Reducing the dependence on oil is a common concern in Asia today : in India, the oil bill has been a major import item for many years; Indonesia, which is an oil producer and a member of OPEC, is now becoming a net importer, and China, which until recently was producing enough (145 million tonnes annually) to meet its requirements, may also have to start buying from the world market in the near future.

1.4. The need for private sector involvement

The (insufficient) expansion of the energy sector in Asia over the past decade, mainly based on public investment, has contributed towards the accumulation of large public foreign debts (totalling about 300 billion ECU) which are worrying governments. Faced with the tremendous amount of capital needed for growth in the energy sector, which is estimated at one hundred billion dollars per year, and taking into account the limited capacity of multilateral lending agencies (about 5 billion ECU per year for the energy sector from the World Bank and the Asian Development Bank put together), many Asian Governments are attempting to mobilise private capital, either nationally or internationally.

This situation is currently causing radical structural changes, since the main obstacle to the mobilisation of the private sector is not so much the lack of financial resources - to some extent available locally - but rather the present legislative, institutional and pricing structure which means that investment in energy is not sufficiently attractive.

1.5. Major impacts on the environment

Even now the development of the energy sector in Asia is already causing significant environmental damage at national, regional and global level : for example China and India burn 1.5 billion tonnes of highly polluting coal each year (accounting for about 12% of world energy consumption) and recent predictions (*Annex 3*) indicate that these two countries alone will be emitting about one-quarter of the world's CO₂ into the environment by 2010.

Both China and India have ratified the UN Framework Convention on Climate Change which aims, inter alia, to reduce global CO₂ emissions. It is difficult to see how the vast increase in coal use planned with the foreseeable future in these countries is compatible with their position under the Convention. Without a strong effort in this regard, the increase in CO₂ output from Asian (and other) developing countries threatens to eclipse or at least seriously compromise the efforts to reduce global CO₂ emissions.

In parallel with this, large-scale deforestation (only due partly to the consumption of wood or charcoal to meet the energy requirements of rural and urban populations) is further worsening the pressure on the environment in some countries. This last aspect affects the poorest population groups, particularly women and children, who are forced to make long journeys to meet these basic needs. Finally, the creation of large dams causes major environmental and social problems which are often badly managed.

1.6. Reforms in the energy sector

Radical changes are currently being seen in the energy sector in Asia. These are taking place along five main lines :

- re-defining the role of the State : new forms of public-private partnership are being set up in a growing number of countries. This leads progressively to more independent (either mixed or private) energy companies, for the purpose of better efficiency, diversification of sources of financing and the provision of a wider range of services. Such strategies should allow governmental policies to concentrate on long-term orientations and appropriate energy-sector regulations and to leave production and distribution to market-oriented operators.
- implementation of new energy technologies, which are cheaper in terms of both investment and running costs, and also cleaner and more efficient (for example combined cycle power stations and gas turbines for cogeneration),
- the desire to reduce the dependence on oil by pursuing policies in the areas of energy management and substitution of primary energy sources (gas and coal),
- an increasing consideration given to the environmental impact of energy projects in terms of population displacement, the local environment, consequences for towns and cities and also on rural ecosystems. Despite this, certain large schemes are already underway and are still proceeding notwithstanding the recognised negative environmental impact,
- a greater attention paid to developing viable, decentralised solutions for rural or peri-urban electrification. In many countries the rural population still counts for 60% of the total population, and often does not have the energy infrastructure which is needed for productive activities.

1.7. Major consequences for Europe

These significant changes in Asia, which involve both the economy in general and also the energy sector in particular, will have repercussions for Europe in the areas of security, employment and the environment :

- The very rapid growth of the demand for energy in Asia will have a severe effect on the world market, particularly the markets for oil, refined products and natural gas, and will certainly also have a not inconsiderable impact on the security of the energy supply in Europe. Upward price pressures could cause economic problems for the Member States, particularly since Europe's dependence on energy imports is due to rise from the current figure of 50% to about 75% in 2015.
- At the present time, the Asian market for energy equipment already represents 50% of the world market and it is still growing. The European market is virtually saturated, with estimated growth rates of between 1% and 2% per year over the next 15 years. For energy operators and European industrial companies, which employ more than two million people and already have some surplus capacity in terms of both staffing levels and production facilities, greater penetration into the Asian market through exports and investment is essential if they are to maintain or develop their world

position and safeguard their jobs or possibly create new ones. The markets for generation equipment in other regions (especially Latin America, Middle East, Maghreb, Eastern Europe and Africa) do not have the same potential as the Asian markets.

- Finally, the rising demand for energy in rapidly developing Asian countries which use coal constitutes an increasing threat to the regional and global environment. Agreements reached by the Community, the Member States and others at the UN Conference on Environment and Development, particularly regarding climate change, will have little practical result unless the negative effect of increased coal use is taken into account.

2. EXISTING ENERGY CO-OPERATION FRAMEWORKS

Many countries² are engaged in co-operation activities in the Asian energy sector, both at bilateral and multilateral level. There follows below a brief summary of the programmes of the European Community and the Member States, and also the guidelines which have been laid down by certain donors and lending agencies : the World Bank, the Asian Development Bank and the Global Environmental Fund.

2.1. The European Community

Today the Community does not have any instrument dealing specifically with energy co-operation with Asia. Nevertheless, the Community has signed, with numerous Asian countries, so-called third generation co-operation agreements, which contain provisions on energy co-operation and has set up a range of instruments which can be used for international co-operation activities in the field of energy. This is shown clearly in the summary table (*Annex 4*).

With regard to energy co-operation, one might mention the following programmes : Council Regulation 443/92 on Co-operation with Asian and Latin American countries which makes it possible to support projects involving technical assistance, training and the promotion of technology (in Asia, 16 projects since 1987 in 14 countries, totalling 56 million ECU), the SYNERGY programme which centres on co-operation in the area of energy policy, the SAVE programme, which relates to institutional and regulatory aspects of the rational use of energy, and the ALTENER programme which relates to the promotion of renewable energy sources and has virtually no Asian activities. Within the fourth framework programme for research and development, the JOULE/THERMIE programme, whose activities are mainly situated in Europe, aims to develop scientific and technological co-operation links with third countries, particularly in the area of renewable energy sources and energy efficiency. Also within the fourth framework programme, the International Cooperation Programme for Developing Countries (INCO-DC) includes support for policy research with a view to promoting clean and efficient energy systems.

The European Investment Bank (EIB) which has been authorised to operate in the Asian region since 1993, has already been able to grant loans to the energy sector in India, Indonesia, Thailand, Pakistan and China, amounting to a total of 300 million ECU. It must be noted that these loans are more and more directed towards financing the European private sector. This approach conforms to subsidiarity with other multilateral or bilateral lending agencies, and with the commercial banking sector (particularly regarding guarantees).

2.2. The Member States

The activities of the Member States in the area of energy co-operation in Asia are mainly aimed at promoting generation equipment within the context of major energy investment projects. It should be noted that these projects, which are the subject of growing international competition, increasingly

² Besides Europe, examples are Japan, the United States, Canada and Australia.

require the direct financial involvement of the suppliers, as well as local equipment fabrication.

It has been found that the Member States have a wide range of tools for pre-financing engineering studies, guaranteeing commercial loans and setting up demonstrations in order to secure good positions for their companies in these markets, and that their intervention in the energy sector does not often take the form of grants. There are essentially three sources of financing :

- **Public development aid**, of which the proportion allocated to energy varies from one country to another, but is usually less than 10%. This is mainly directed towards the most disadvantaged countries and population groups, and mostly involves renewable energy sources in rural areas or training and institutional support intended to improve the efficiency of the energy sector. In many countries this type of aid has been found to be gradually falling.
- **Own resources of major operators** in the European electrical and gas sector, which are prepared to make sustainable investments in Asia within the framework of their new business strategies, working together with local partners, in order to take up a position in these markets. The amounts which these businesses are prepared to invest usually range from about 75 to 100 million ECU per year.
- **Loans granted by the European banking system**, which is already present and active in Asia. However the setting up of major energy projects (more than 500 million ECU per project) is becoming a more delicate issue at a time when Asian Governments are increasingly reticent about providing guarantees.

2.3. Other Donors and Lending Agencies

- The World Bank

The World Bank has clearly identified the electricity sector and the environmental aspects associated with the development of the energy sector as its priorities in Asia. It considers that the level of investment needed in the energy sector in Asia is of the order of 100 billion dollars per year. The World Bank, with commitments of between 1.5 and 2 billion dollars per year, concentrates on sectoral policies and promoting the involvement of private investors in the energy sector. It has specific financial structures available for this purpose, such as the International Finance Corporation (IFC) which has recently granted two loans of 250 million US\$ to electricity companies in India and the Philippines, the Multilateral Investment Guarantee Agency (MIGA) and the Expanded Co-financing Operation (ECO). The sectoral loans usually include an institutional component, reorganisation in the energy sector and environmental impact studies, but in some Asian countries the very liberal approach of the World Bank clashes with the Governments' own positions. The grants and subsidised loans which are managed by the IDA represent only a tiny proportion of the energy portfolio, and only countries whose GDP per inhabitant is below a certain threshold can benefit from these.

- The Asian Development Bank (ADB)

In 1994, the ADB redefined its policy on intervention in the energy sector, which now focuses on 6 points :

- ▷ structural reforms in the electricity sector, which is in crisis in a number of countries, especially with a view to expanding the role played by the private sector,
- ▷ energy efficiency, both on the supply side (reduction of losses) and on the demand side through an approach involving integrated resource planning (IRP) and demand side management (DSM),

- ▷ establishing energy pricing structures which are based on costs and market factors,
- ▷ energy development in rural areas, particularly fuelwood, solar and wind energy,
- ▷ regional energy co-operation, particularly for large hydro-electric projects,
- ▷ finally, the environment, with the development of "guidelines" for the implementation of energy projects and the promotion of clean coal power stations and combined cycle installations.

- The Global Environmental Fund (GEF)

This fund, which is based on grants received from industrial countries according to a procedure similar to the IDA, makes it possible to finance the additional costs associated with protecting the global environment in developing countries, in the areas of biodiversity, international waters, the ozone layer and the reduction of greenhouse gases. The GEF has just been reorganised, with a budget of about 1.5 billion ECU for three years. It is jointly administered by the World Bank, for investment projects, the UNDP for technical assistance projects and the UNEP for research programmes. Through its greenhouse gas reduction department, the GEF can finance projects in the energy sector whose aims include reducing the environmental impact of certain coal-fired thermal power stations, or promoting gas turbines and renewable energy sources.

Part II. STRATEGY

3. A NEW STRATEGY FOR ENERGY CO-OPERATION WITH ASIA

An analysis of the energy situation in most Asian countries and the existing energy co-operation frameworks shows clearly that the European Community can and should play a much more important part. It is therefore proposed that a specific strategy should be defined for energy co-operation with Asia, according to the following guidelines :

3.1. Three objectives

The three main objectives of the Community energy co-operation are :

- ▷ **To strengthen the security of supply in Asia and in Europe,**
- ▷ **To participate in Asian energy markets,**
- ▷ **To protect the global environment.**

3.2. The Community framework

These main objectives fit naturally within the framework of more general strategic objectives which are already being set by the European Community. On the subject of energy and the Asian region, the framework is defined on the basis of the following factors :

- **The "new strategy towards Asia"³**, which takes into account Europe's strategic interests in this region and the current requirements of its Asian partners, particularly with a view to strengthening the Union's economic presence in Asia, contributing towards stability in Asia and encouraging economic development in the least prosperous countries and regions of Asia.
- **The White Paper "An Energy Policy for the E.U."⁴** which shows very clearly that it is absolutely essential for Europe to co-operate with Asia to ensure a secure energy supply, to contribute towards the considerable energy investments which are anticipated in Asia, and finally to protect the global environment.
- **Directives and priorities adopted by the Council**, such as Regulation no. 443/92 on financial and technical aid and economic co-operation with the countries of Asia and Latin America, the fourth framework programme for research and development⁵ (particularly the JOULE-THERMIE Programme), and also the proposed regulation on a programme of co-operation with third countries in the area of energy policy (SYNERGY Programme⁶).

3.3. A global intervention

In order to achieve these long-term objectives, Community activities should address equally both energy supply and demand, in two main areas : the optimum utilisation of local energy resources, which means

³ COM (94) 314

⁴ COM (95) 682

⁵ Decision n° 110/94/EC of 26 April 1994

⁶ COM (95) 197

finding substitutes for imported energy sources while also improving the efficiency of existing production units, and the management of energy consumption, both now and in the future, which will make it possible to reduce the pressure on natural, environmental and financial resources.

3.4. A specific approach

The European Community is different from many other donors and lending agencies as its interventions mainly consist of grants (with the exception of the loans granted by the EIB recently). This situation allows the European Community to offer a unique advantage towards Asian countries who often hesitate to use loan-financing for feasibility studies, research and development or technical assistance. The Community can also place its co-operation activities within a long-term perspective and safeguard collectivity interests as regards the global environment.

Neutrality and diversity in technical, institutional and financial experience covering the energy sectors of the Member States represent other assets. These are being recognised by the Asian partners.

The Community can therefore act as a "catalyst" to encourage the best skills in Europe to meet the expectations of its partners, while facilitating the activities of its Member States and their operators in Asia. In this context, the European Investment Bank would normally support downstream activities.

With this aim in mind, the approach of Community co-operation will include the following elements :

- **establishing an ongoing dialogue** on energy policy between the Community and Asian countries on a bilateral basis or through competent international or regional organisations. This is needed because of the global consequences of choices which are made in the Asian energy sector,
- **mobilising the Asian and European private sector** is absolutely necessary because of the major capital requirements and because of the need to find a more efficient way of running the sector,
- **taking account of social and environmental aspects**, particularly the needs of poor urban and rural populations. Cooperation with Asia in the field of energy should be sensitive to the need to achieve an equilibrium between environmental, social and economic developmental factors.

4. SELECTION CRITERIA FOR COMMUNITY ACTIVITIES IN THE AREA OF ENERGY CO-OPERATION

Energy co-operation activities will be selected according to a number of criteria :

4.1. Mutual interest and partnership

The identification of a mutual interest between Asia and Europe will be the starting point to justify each new project, and this will be expressed in terms of benefits for both partners in the short, medium or long term. What is more, the concept of partnership implies that resources will be made available by both sides in the interests of the project. This principle is well accepted from the Asian point of view, as has been seen from recent energy co-operation projects.

4.2. Subsidiarity with regard to the activities of Member States

The Community must be particularly vigilant in order to avoid any duplication with bilateral activities undertaken by Member States. The Community should also concentrate its efforts on projects which clearly have a real European "added value" compared with the bilateral projects carried out by Member States.

In particular, the Community will accord special preference to projects requiring the diversity of the European experience or concerning sensitive issues where Asian partners expect a certain neutrality regarding technological, legal or institutional options. Similarly, the Community, because of its unique experience, is a privileged partner for Asian authorities in the area of regional energy integration.

4.3. Co-operation with other Multilateral agencies

Regular consultations with other Multilateral agencies, (notably EIB, IEA, UNDP, WB and ADB) will make it possible to ensure the cohesion and complementarity of the various activities, while also enabling the various tools to be used to optimum advantage.

4.4. Durability

Community intervention should be seen as a catalyst which makes it possible to initiate dialogue or exchanges between Asian and European players. It will therefore only cover a limited period. The projects should be designed and implemented in such a way that when the Community support comes to an end, the activities are taken over by the players involved (the State, public bodies, energy operators, financial institutions or industries). Some prudence will therefore have to be exercised when it comes to creating public or semi-public structures.

5. PRIORITIES FOR CO-OPERATION IN THE ENERGY SECTOR

5.1. Priority areas

Having analysed the energy situation in a number of Asian countries, (see Chapter 1) and taking into account the objectives and specific approach of Community activities, five priority sectors have been identified covering both energy supply and demand :

- **Modernising the electricity sector**

The electricity sector alone represents almost 80% of all energy investments in Asia each year, amounting to more than ECU 40 billion per year. This sector is undergoing major technical, financial and institutional changes, and it provides tremendous scope for Community co-operation, taking into account the diversity of the organisational structures of Member States.

More specifically one might mention the development of energy policies and the adaptation of the institutional frameworks which determine how new financing schemes are implemented; the promotion of "clean and efficient" technologies for the generation and use of electricity; and also the modernisation of electricity distribution companies.

- **Promoting natural gas**

This sector, which is not yet very well-developed, will become increasingly important as Asian countries want to increase their local supply in order to reduce their dependence on the outside world for energy and begin to take environmental aspects into account. In particular, very significant developments are expected to take place in China, India, Bangladesh, Indonesia and the Philippines. Natural gas is a priority sector for most countries and the Asian Development Bank estimates that it could grow at an average annual rate of more than 10% in the region.

- **Introducing "clean coal" technologies**

Coal, which is used on a massive scale in some countries such as China and India, is also being developed in other countries such as Indonesia which have large reserves. Coal already accounts for

some 30% of all the energy consumed in Asia. Electricity generation using coal will continue to grow very rapidly (60% of the additional installed capacity in China), which will have important environmental consequences at local and worldwide level.

- **Rational use of energy (energy efficiency)**

The Community will devote special attention to the five sub-sectors set out below :

- ▷ Reducing losses in the generation process given that considerable savings can be made by the major energy operators.
- ▷ The rational use of energy in industry, which is the largest consumer of commercial energy in many Asian countries. Although the rapid modernisation will certainly lead to improvements in the way energy is used in industry, there is still considerable scope for savings and actions in this area will have a strong impact on the environment in the regions in question.
- ▷ The rational use of energy in transport, particularly road transport. In most Asian countries more than half of all oil products (60% or more) are consumed by this sector, which is growing rapidly and contributing to serious environmental problems e.g. global warming and pollution. In the long term, the solutions to these problems depend on policies which go far beyond the question of energy to include transport policy, land management and transport infrastructures and investment policies, particularly those related to public transport.
- ▷ The rational use of energy in the residential tertiary sector. As standards of living improve, energy consumption in the urban areas of Asia is growing rapidly, particularly with the introduction of air conditioning. Particular attention should be paid to cost effective solutions for low energy buildings.
- ▷ Development and rational use of communication infrastructure to reduce the need for transport of goods and persons, to optimise energy distribution as well as to allow for environment degradation monitoring.

- **Supplying energy to rural areas by an increased use of new/renewable energies**

It is estimated that one billion people in Asia live in rural or urban peripheral areas which are inadequately supplied with basic energy services, such as modern combustion fuels and stoves (for cooking and heating), lighting, small-scale audio-visual equipment and other small machines.

Taking into account the scale of the problem, Community financing for equipment can only be marginal. On the other hand, the Community will be in a position to promote the positive experiences gained by European players within the framework of many bilateral and multilateral projects. In particular, renewable energy sources (which are not often financially and economically viable, except under very specific geographical, technological and economic circumstances) have two essential positive aspects : they do not impose a burden on the environment and they require considerable involvement of rural users, which gives rise to "development" activity in rural areas.

The Community will therefore take steps to promote these energy solutions when they are economically justified by integrating them into its numerous rural development programmes. These technologies will be popularised more effectively by those responsible for rural development, health or education than by energy organisations or electricity companies, for whom rural energy supply is often only a secondary priority.

Generally speaking, the Asian agriculture sector consumes very little "commercial energy". There is nevertheless, room for improvement in the water-pumping process, transport, storage and product treatment. Utilising agro-waste or urban waste as an energy source for agro-industries also offers interesting possibilities for energy co-operation at Community level, as a current Euro-ASEAN co-operation programme illustrates.

5.2. The other sectors

Other sectors for intervention are possible but would appear to have a lower priority for Community

action although this does not mean they might not be important in a more restricted geographical context.

- **Nuclear energy**

Nuclear energy is already used for electricity generation in several countries in Asia. Some countries are making preparations to use this option, with the support of Western companies, while others have recently given it up. As in other parts of the world, the recourse to nuclear energy is the subject of an intense and complex debate.

However, the Asian region is expected to provide the main area of nuclear energy expansion worldwide, over the next decades. Accordingly, a priority of the European Community in relation to the nuclear programmes under development in Asian countries would be to support and consolidate activities conducted at international level to ensure a peaceful and safe use of nuclear energy.

- **Oil and oil products**

On the whole the development of oil resources is being well managed by the Asian countries who are already receiving a great deal of technical assistance from international oil companies.

- **Hydropower**

The region still has very considerable hydropower potential and major programmes are planned or are being carried out. The implementation of these giant projects poses major environmental problems, which are currently being systematically examined by the providers of the capital involved. The Community may be able to intervene in these major projects in order to consider aspects which facilitate regional energy integration. On a different scale, the Community will continue to encourage the development of small hydropower plants within the framework of its rural development projects.

6. IMPLEMENTATION

6.1 Creating dialogue

This new cooperation strategy in the field of energy must fit into the more general framework of the cooperation established between the Community and its Asian partners. The Community will therefore make efforts, either on a bilateral basis or through competent international or regional organisations, to establish an ongoing dialogue with Asian authorities on aspects of energy policy which are of mutual interest, particularly in the field of planning, optimum use of resources, new technologies or financing schemes. The dialogue thus established will permit the definition of priorities by sector and by type of Community intervention in the different countries or regions concerned.

6.2 Targeting actions

The sustainable development of the energy sector in Asia requires increasing involvement from the private sector, at both the local and international level (particularly Europe). Three conditions have however to be fulfilled in order for this to take place :

- ▷ the awareness of tried and tested solutions,
- ▷ the existence of a framework to promote exchanges and investments,
- ▷ the mobilisation of motivated and confident investors and operators.

Depending on the sectoral priorities selected within the framework of the established dialogue and according to specific geographical factors, the Community will intervene at the most appropriate level to best fulfill these conditions. Three levels of intervention are therefore proposed, reflecting a progressive

commitment of the resources available to the Community, as is illustrated by the activities set out below :

6.2.1 Increasing awareness

In response to requests from numerous decision makers in government bodies and energy companies in Asia, awareness actions will provide more information about the technical or organisational solutions being used in Europe. The Community could thus organise short-term visits or information seminars in both Europe and Asia, on various themes such as policy and regulatory frameworks, planning methods, institutional structures, energy operators and clean technologies. In the area of energy management in urban transport, for example, the Community could initiate exchanges of experience with European cities which have successfully run campaigns in this area, particularly insofar as it relates to energy-efficient public transport systems. In respect of energy utilisation in industry, the Community could improve the information and awareness capabilities of the major industrial consumers.

6.2.2 Adapting institutional frameworks

The mobilisation of national or international private capital and the development of economic exchanges in the energy sector cannot take place unless there is an appropriate energy policy, which includes a suitable legislative and regulatory framework, clearly defines the rules of the game between energy operators and States, and provides the necessary guarantees to investors and commercial partners. Similarly, the implementation of rational use of energy programmes often requires organisational adjustment of the pricing structure for the different energy types, alteration of building construction codes and standards, and changes in industrial standards.

The Community will help with the formulation of policies or adaptation of institutional frameworks, depending on specificities and the national priorities of the countries concerned, by making expertise available, supporting human resources development and master plans or strategic studies, particularly at regional level (network integration and energy exchanges actually increase the overall efficiency of national systems : through management of staggered peak consumption times, higher reserve margins etc. which help to improve the stability of markets and protect the environment).

In particular, the Community can support training scholarships in Europe or long-term missions which take professionals to Asia, on themes such as programme contracts between the State and energy companies, innovative financial schemes ("Build Operate Transfer, Build Operate Own, Third Party Financing), or technical, economic or legal aspects relating to the integration of electrical or gas networks.

A desired Community intervention : the need for support activities of this kind was clearly expressed in a survey conducted among 150 representatives of the Member States, including public administrations, banks and financial institutions, energy companies and industries. European investors are actually put off by the "blur" of institutional and legislative contexts in many Asian countries, and consider that co-ordinated Community action, perhaps linked with commercial negotiations, would help to clarify these legislative and regulatory frameworks.

On these questions of adapting institutional frameworks, synergy will be sought with other multilateral agencies, especially the World Bank.

6.2.3 Supporting European energy companies and operators

In some sectors, making Asian players aware of European solutions and the existence of an institutional framework which is well-suited to economic exchanges may not be enough to set these exchanges off spontaneously. The Community may therefore intervene through direct involvement with companies,

working in different ways depending on the market.

- ▷ As regards the traditional activities of providing equipment or direct involvement in major projects, the tools used by the Member States and the resources which are available to large companies have generally been found to be adequate. However, the Community can help to find openings for European operators in these extremely competitive markets, for example by encouraging "twinning" between energy operators in Europe and Asia, or by supporting exchanges of personnel for short periods. It should be noted that the success of these operators or European investors is all the more important since it allows equipment markets to be opened up to hundreds of European businesses of all sizes which work as sub-contractors for these "leaders".
- ▷ With regard to the newer sectors (often covered by SMEs), the Community will help to publicise tried and tested European technologies, promote their results and, if necessary, produce the initial references, in order to overcome the market's natural reticence when faced with innovative solutions. In the interests of both Asian partners and European enterprises, the Community can also facilitate and speed up access to these new markets for such companies, particularly by initiating or assisting in the formation of business consortia. These "niches" which are new in Asia but mature in Europe might include the following: Demand-Side Management (DSM), particularly in specific industrial sectors such as the cement industry, textiles, chemical industries, metallurgy, agro-industries, etc.; independent power production (IPP); telecommunication systems; Rational Use of Energy; "clean" electricity generation technologies (coal-fired power stations with a fluidized bed, smoke treatment plants, co-generation plants using natural gas or biomass, and energy recovery systems).
- ▷ Promotion efforts should therefore be undertaken so that companies are encouraged to use the existing tools for support financing, in particular the ECIP facilities and also loans from the European Investment Bank. Depending on the actual needs, the Community could also develop new modalities to support SMEs.

6.3. Allocating sufficient resources to meet the challenges

Asian countries need to mobilise yearly about \$ 100 billion for energy investments in the form of loans or participating interests, both from the public sector and also from the national and international private sector. To meet such challenges - and building on existing Community resources within current budgets and instruments - the Community could significantly increase, in the next five years, the amount of grants available for Euro-Asian energy co-operation (currently, 5-10 million ECU per year). These Community funds would of course be supplemented by an appropriate contribution from Asian and European partners.

CONCLUSION

The expanded outlook for the energy sector in Asia during the next years represents for the European Community a tremendous challenge, from either an economic, social or environmental viewpoint.

Thanks to its "plus points", often recognised by the Asian partners, the Community can contribute more than significantly to meeting the energy and environment challenges by supplementing both the actions undertaken by its Member States and the initiatives of international financial institutions.

Equally the European Community can contribute to an increase in the European economic and business presence in these fast growing energy markets, which are vital for hundreds of thousands of jobs in Europe where the markets are almost saturated.

The current Community actions, while extremely useful, are highly specialised and need to be focussed within an overall strategy for Euro-Asian energy co-operation. Accordingly, such a strategy should be agreed and implemented with sufficient resources and means, within existing instruments and budgets, to make it credible and efficient.

Taking all the above into account the Council and the Parliament are invited to adopt the approach outlined in this document so it can be used as a basis for Europe-Asia energy co-operation.

ANNEX 1 : SOCIO-ECONOMIC DATA FOR ASIAN COUNTRIES

COUNTRY	Population (millions) 1994	Area (1000 km ²)	GNP per capita in US\$ - 1994	GNP in billion US\$ 1994	Urbanisation rate in % - 1992	Average annual growth rate in energy production	Average annual growth rate in energy consumption 1980-1992	Energy consumption per capita in kg of oil equivalent 1993	Installed electric power capacity in MW 1992	Household supplied with electricity % in 1984	Electricity losses as % of total generated in 1990
BANGLADESH	118	144	230	26,6	18	14	9	59	2.392		30
BHUTAN	0.7	47	400	0,3	6	2		33			
CAMBODIA	10	181	200 ^a	2,0 ^b	20			52	59		
CHINA	1.191	9.561	530	630,2	27	5	5	632	137.890		15
INDIA	914	3.288	310	278,7	26	7	7	243	74.000	54	19
INDONESIA	190	1.905	880	167,6	32	4	7	330	9.256	14	21
LAOS	5	237	320	1,5	20	- 1	3	39	23		17
MALAYSIA	19	330	3.520	68,7	45	13	10	1.545	5.280	64	16
MYANMAR	46	677	725	37,8 ^c	25	- 1	- 1	39	808		36
NEPAL	21	141	200	4,1	12	15	8	22		30	27
PAKISTAN	126	796	440	55,6	33	7	7	226	8.854	31	24
PHILIPPINES	66	300	960	63,3	44	6	3	328	6.174	46	19
SINGAPORE	3	1	23.360	65,8	100		7	5.563	627	98	3
SRI LANKA	18	66	640	11,6	22	8	1	110	15	18	
THAILAND	59	513	2.210	129,9	23	28	10	673	9.650	43	11
VIETNAM	72	330	190	13,8	25			77	2.771		
TOTAL	2.858,7	18.517	545	1.557,20	27						

Sources : The World Bank Atlas,1996; World Development Report 1994 : Infrastructure for development, The World Bank.

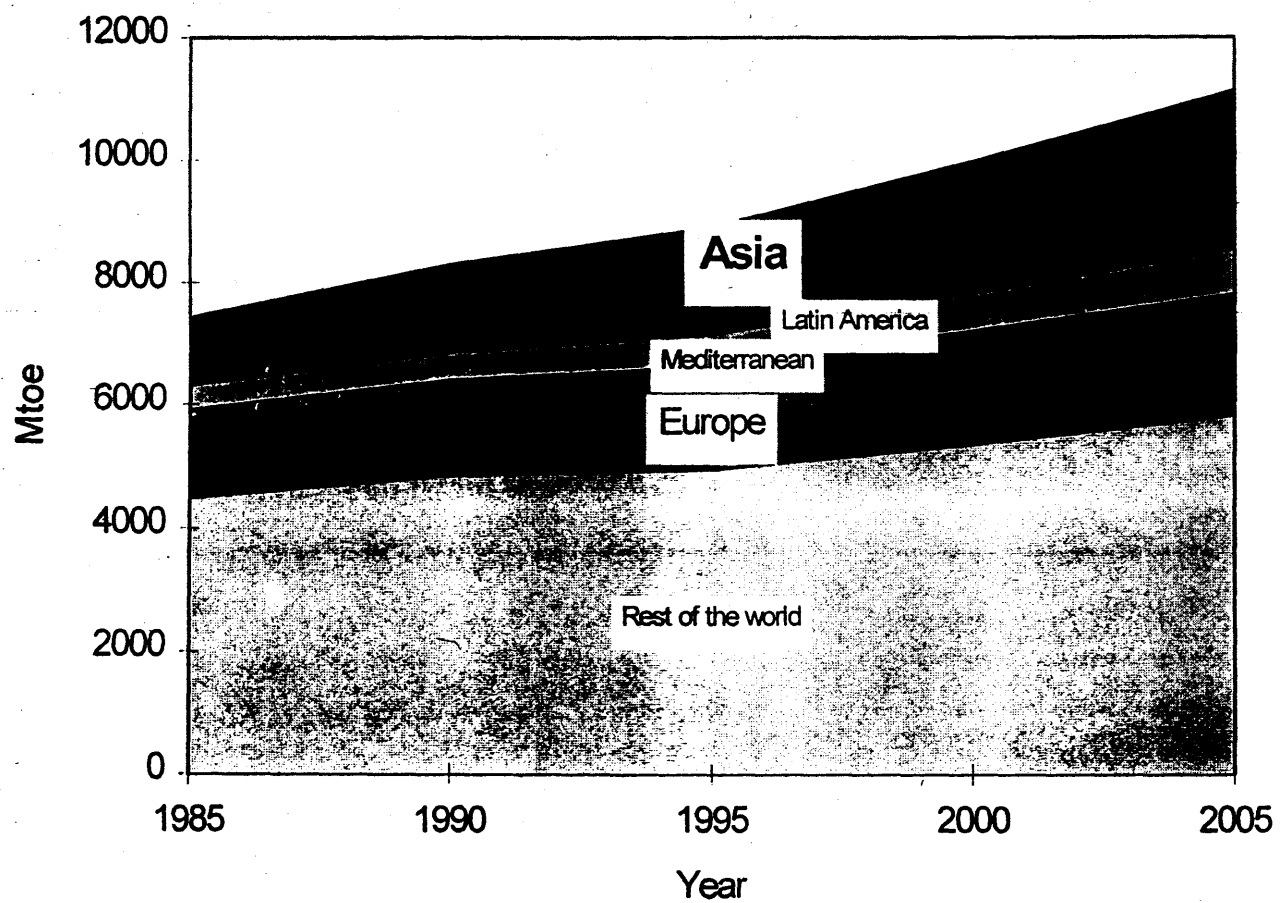
^a 1992

^b 1992

^c 1992

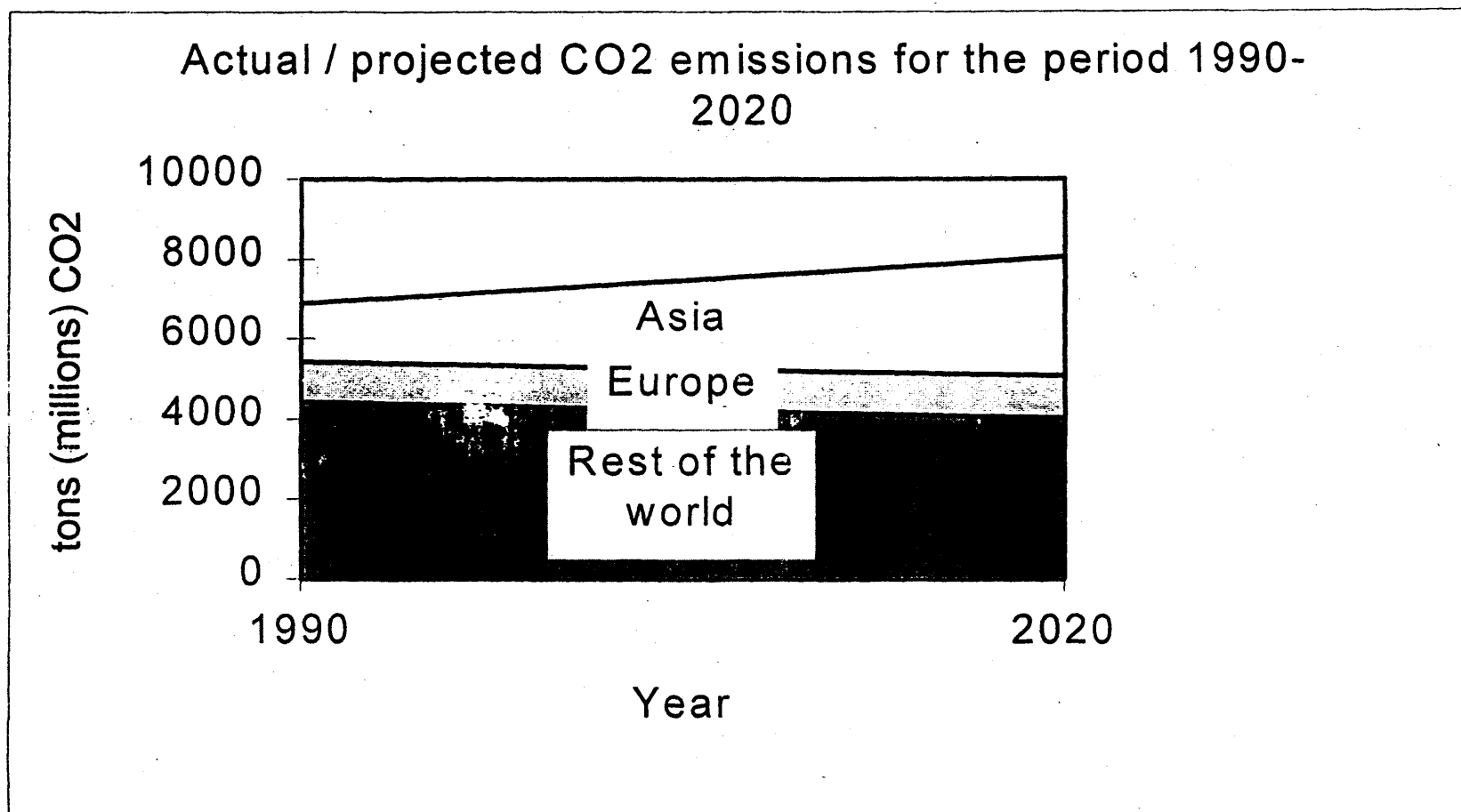
ANNEX 2

Evolution of the world's primary energy consumption



Source : European Commission, DG XVII, (Energy)

ANNEX 3



Source: World Energy Council, 1994 : "Energy for tomorrow's world".

ANNEX 4 : INSTRUMENTS OF INTERNATIONAL CO-OPERATION IN THE ENERGY SECTOR

PROGRAMME	TYPE OF PROJECTS BEING FINANCED	GEOGRAPHICAL AREA COVERED	DURATION OF THE BUDGET	PROGRAMME (in MECUS)	TYPE OF AID
Fourth framework programme for research co-operation with third countries	Technological research and development, including demonstrations	All third countries	1994-1998	540 in total	subsidies
PHARE	Technical assistance and co-financing of investments	CEEC	annual	1,000 in 1994 including 58 energy	subsidies
TACIS	Technical assistance	CIS	annual	510 in 1992, including 130 energy	subsidies
EURATOM	Investments to improve the security and reliability of nuclear power stations	CEEC + ex URSS	1994-1998	1,000	loans
ECSC	Investments in the coal and steel sectors	CEEC	since 1990	200	loans
EBRD	Investments in all sectors, including energy	CEEC + CIS	unlimited	10,000	3 % participation in the capital of the EBRD
Mediterranean Renewal Project	* Protocols for each country * Regional co-operation	Mediterranean	1992-1996	2,940 2,075	donations and EIB loans (2,062) donations and EIB loans (1,800)
Lomé Convention	Investments, training and technical assistance for all sectors, including energy	70 countries in Africa, the Caribbean and the Pacific	1992-1995	12,000	subsidies and EIB loans (1,200)
EIB	Investments in all sectors, including energy Investments in all sectors, including energy	CEEC Asian and Lat. American countries	1994-1996 1993-1995	3,000 750	loans loans
Co-operation with Asia and Latin America	Investments in equipment, training and technical assistance for all sectors including energy	Asia and Latin America	1991-1995	2,750	subsidy
ECIP	Co-financing through joint ventures of all sectors, including energy	All developing countries	annual	40 + banking funds	interest-free loans subsidies which are repayable in the event of success
JOULE-THERMIE	Technological research and development including demonstration : non-nuclear energy	Community + third countries	1994-1998	1,002 ****	cost-sharings
Synergy	Energy policy and strategy	All third countries	annual	8 in 1994	subsidies
SAVE	Rational use of energy : promotion, regulatory activities, information and exchanges	Community + third countries	1991-1995	35 ****	subsidies
ALTENER	Renewable energy sources : promotion, regulatory activities, information and exchanges	Community + third countries	1993-1997	50 ****	subsidies
Note : unless otherwise indicated, the amounts shown relate to the entire duration of the programmes **** : Total amount including EC					

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