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**COMMUNICATION FROM THE COMMISSION  
TO THE COUNCIL AND THE EUROPEAN PARLIAMENT**

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## Energy cooperation with the developing countries

### Introduction

The Johannesburg World Summit in August-September 2002 (Rio + 10) will for the first time address globally the issue of sustainable development. Energy is likely to be high on the agenda in view of its central role in the three dimensions of sustainable development: the social dimension, the economic dimension, and the environmental dimension. In the particular context of energy and development, these preoccupations basically translate into providing energy services and secure and affordable energy supply for the eradication of poverty and for economic development and into clean and safe energy technology to address climate change, urban air pollution and other risks to human health and the environment.

Neglected for a long time, in recent years - and particularly in the context of the work in preparation for the Johannesburg World Summit - energy has become an essential part of the sustainable development debate. The Johannesburg Conference should provide an opportunity to catch up in this area, by allotting to energy the place that it deserves in order to contribute to sustainable development. The Seville European Council (21-22 June 2002) emphasised the EU's commitment to the success of Johannesburg and its desire to encourage initiatives, in particular in the field of energy, including renewable energy sources.

The EU's experience and aid can facilitate the establishment of a sustainable energy sector in the developing countries. Energy is in effect essential to achieve the Millennium Development Goals.<sup>1</sup> Similarly, energy is linked directly or indirectly to each of the six sectoral priorities of Community development policy.<sup>2</sup> At the same time, the EU's security of supply is closely linked to that of the developing countries. They will be even more closely linked in future as a result of the expected increase in consumption of fossil fuels and the aggravation of environmental problems, in particular climate change and air pollution.

Energy, a sector where three major issues (poverty reduction, security of supply, and environmental protection) coincide, should be integrated, in its three dimensions, into the existing EU cooperation instruments, namely development policy, energy policy, environment policy and research policy.

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<sup>1</sup> The are seven Millennium Development Goals: (1) halve extreme poverty and hunger, (2) achieve universal primary education, (3) promote gender equality, (4) reduce child mortality, (5) improve maternal health, (6) combat AIDS and other epidemics, (7) ensure environmental sustainability. There is a close link between access to basic energy services and these objectives.

<sup>2</sup> The first objective of Community development policy is the eradication of poverty (cf. COM(2000)212). The six priority sectors of Community development policy are: (1) the link between trade and development, (2) support for regional integration and cooperation, (3) support for macro-economic policies, (4) transport, (5) food security and sustainable rural development (6) institutional capacity-building, good governance and the rule of law.

How can the sustainable physical availability of energy products on the market be assured at a stable price which is affordable for all consumers, for the welfare of the populations and the smooth functioning of the economies? In the run-up to the Johannesburg Summit and beyond, this Communication seeks to propose a framework for discussion, a cooperation framework based on the ownership principle and concrete recommendations to integrate energy more effectively into the sustainable development concept. The EU Energy Initiative which will be presented in Johannesburg is at the heart of these concrete cooperation proposals.

A) The facts

**Energy inequality** - at present, nearly two billion people in the world - concentrated in peripheral urban areas and isolated rural areas - do not have access to basic energy services.<sup>3</sup> This is the energy paradox which characterises the beginning of the XXIst Century. This energy inequality affects in particular two-thirds of the African population, who depend to a very large extent on traditional biomass<sup>4</sup> for their energy supplies.<sup>5</sup> The non-rational use of biomass has harmful consequences for health and the environment. There are also strong links between energy and gender. The burden of survival activities such as collecting biomass and using it for cooking – with the related health problems due to indoor air pollution - often falls on women, while the availability of modern energy services could reduce this drudgery.

**Access to energy: energy as a *sine qua non* of the action to combat poverty** - A corollary of the right to development is access to basic energy services. Energy is instrumental in all the key sectors of development - health, refrigeration of food, lighting and domestic heating, transport, agriculture, industrial production and modern means of communication. To paraphrase a famous saying, is development not democracy plus electricity?

Access to reliable, high-quality sustainable energy is essential, both for those currently without access to energy services, and for the future productivity increases and economic development needed to accommodate the forecast population growth and urbanisation. Where energy is lacking, poverty develops and an "energy-poverty" vicious circle comes into being. In this respect, the question of access to energy is also an ethical issue, and one which is of particular concern in the least developed countries. One of the best ways of breaking the "energy-poverty" vicious circle undoubtedly lies in the possibility of having access to knowledge, i.e. education and training. In this connection, new technologies and the information society represent an opportunity which the developing countries must be able to seize. It cannot be seized without energy, and it is therefore urgent to combat energy deprivation in order to avoid this opportunity being transformed into a new North-South divide.

Looking beyond the question of the environment, energy, like water, is not a good like others. It is a powerful factor in regional development, in particular where electricity is concerned. The problem is particularly acute in the developing countries, where it is

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<sup>3</sup> "Basic energy services" means access to electricity for lighting, refrigeration, telephones, radios and televisions, as well as fuels, kerosene and LPG for cooking and heating.

<sup>4</sup> "Traditional biomass" covers wood-fuel, agricultural residues, animal wastes, charcoal, etc.

<sup>5</sup> In sub-Saharan Africa, with the exception of South Africa, traditional biomass represents over two-thirds of total energy consumption. Source : "Energy as a Tool for Sustainable Development for ACP countries" 1999, European Commission and UNDP.

necessary to avoid the exodus of rural populations to urban centres where situations of extreme poverty arise. As with the control of fire in the early days of mankind, energy is a powerful factor in economic and social cohesion.

**The global character of energy markets, and of the implications of energy use** – The volatility of the international energy markets is particularly sensitive as far as the developing countries are concerned, in particular the countries which are net oil importers, since they are the main victims of an increase in oil prices,<sup>6</sup> and some of them spend up to 50% of their trade surpluses on energy imports. Similarly, the consequences of climate change (drought, flooding, hurricanes, etc.) primarily affect the developing countries, even though they only account for a comparatively limited proportion of global CO<sub>2</sub> emissions (37%).<sup>7</sup> Most of the major natural disasters in recent years (Hurricane Mitch, flooding in Bangladesh, drought in the Horn of Africa) have been concentrated in the least developed areas of the planet. Likewise, the relentless rise in the level of the oceans is threatening the existence of many Pacific micro-States. Victims to some extent of the energy schemes of the XXth Century, paradoxically the developing countries need to become protagonists in the energy developments of the XXIst Century.

**The heterogeneity of the developing world** - Quite apart from the uncertainty surrounding the very definition of the concept of "developing country",<sup>8</sup> the developing world is very diversified when it comes to energy. Some developing countries are net energy importers, while others are net exporters or transit countries. There is a marked difference between the net oil importers and the crude producers. The energy mix is also very different from one country to another.

The Mediterranean region is a good illustration of this diversity in terms of energy situations: within a single region there are, side by side, producing and exporting countries such as Algeria and Egypt, energy-dependent countries such as Lebanon, and transit countries like Morocco. This heterogeneity renders obsolete any approach aimed at applying the same "recipies" in the different developing countries. Another illustration of the developing world's energy complexity is that having a wealth of energy raw materials is not always, by a long chalk, synonymous with eradication of underdevelopment and poverty. The example of the mono-exporting economies (Venezuela, Algeria, Nigeria) is significant in this respect.

Last but not least, the case of Least Developed Countries (LDCs) is one more example of the diversity of energy situations in the developing world. LDCs are indeed characterised by very low levels of access to adequate energy services. In particular, they are heavily reliant on biomass use (principally for cooking and heating), resulting in a heavy burden of fuel collection, especially for women and children, as well as poor indoor air quality, and frequent unsustainable use of natural resources.

**Profoundly differing energy situations between the EU and developing countries** – Compared with the EU, the developing countries are characterised by very high population growth and low energy consumption and efficiency. **On average, per capita**

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<sup>6</sup> According to the OECD's calculations, a \$10 increase in the price of oil over a year would reduce growth in the EU by 0.2%. The impact is five to ten times greater in the energy-dependent developing countries.

<sup>7</sup> Source : European Commission Annual Energy Review 2001.

<sup>8</sup> The existing terminology on the subject is that of the United Nations and of the DAC in the OECD.

**electricity consumption in the developing countries is one-tenth of the figure in the European Union.**<sup>9</sup> The forecast is that in the next few years there will be a significant increase in energy demand in the developing countries,<sup>10</sup> on account of population growth, increasing urbanisation and economic development. However, per capita consumption will continue to be significantly lower on average in the developing countries than in the industrialised countries; in sub-Saharan Africa in particular (with the exception of South Africa), per capita energy consumption is tending towards stagnation. This wide variety of situations is a fundamental factor in energy cooperation relations between the EU and the developing countries. However, it does not prevent the existence of common energy cooperation objectives and interests between the two parties (diversification, economically sustainable security of supply, economic growth, competitiveness, environmental protection, energy efficiency) or risk-sharing (depletion of fossil fuel reserves, environmental damage) in the event of failure to control the situation.

B) The international context

**Growing, albeit recent international concern** – apart from the issue of climate change, energy has for a long time been absent to a large extent from certain major international processes. For example, the Doha Conference's agenda for development makes no specific mention of energy. Only recently has it emerged as a growing international concern.<sup>11</sup> The issue of energy in developing countries is, as it were, an orphan without an international parent organisation to look after it and specialise in these matters. The International Energy Agency, for instance, which brings together the richest countries of the world, has never concerned itself in any significant way with the question of energy in developing countries.

The forthcoming Johannesburg Summit could raise the profile of sustainable energy.<sup>12</sup> However, energy is far from being the number one priority at international level. For the most part, the rich countries themselves have only accorded secondary importance to the question of energy development, as the G8 debates demonstrate. The discussions on this topic are still to a large extent incoherent and more connected with developments in the action to combat climate change.<sup>13</sup> While declarations of intention are necessary, they need to be followed up by concrete action as part of a coherent framework.

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<sup>9</sup> One-seventh in terms of total energy consumption.

<sup>10</sup> According to the POLES model, it is estimated that in 2020 the developing countries will account for 50% of global primary energy consumption compared with nearly 40% at present; the forecasts also indicate a doubling of electricity consumption in those countries between 1995 and 2020.

<sup>11</sup> Mention should be made of the following in particular:

- the 3rd United Nations Conference on the least developed countries (May 2001) the action programme of which includes recommendations on energy and sets out priority actions;
- the resolution on renewable energy recently adopted by the joint EU-ACP Parliamentary Assembly (29 October – 1 November 2001);
- the recent G8 Energy Declaration (Detroit, May 2002) which emphasises energy cooperation with the developing countries and refers to the report submitted to the Genoa G8 Summit by the renewable energy task force.

<sup>12</sup> Cf. Commission communication "Towards a global partnership for sustainable development" for the Johannesburg Summit: COM (2002) 82 final.

<sup>13</sup> The climate change topic was addressed for the first time at international level at the 1992 Rio Summit, culminating in the 1997 Kyoto Protocol. The 7th Conference of the Parties for the implementation of the Kyoto Protocol (CoP7) in Marrakech in November 2001 paved the way for the concrete implementation of the Protocol.

C) Action by the EU

**Energy is part of EU development aid policy** – Some EU Member States place significant emphasis on energy in their development aid programmes. However, following the refocusing of the priorities of Community development aid in 2000, energy is not a sectoral priority of Community policy. Nevertheless energy has a key part to play in underpinning activities in the 6 priority areas of Community development cooperation. Taking this situation into account, energy projects proper account for less than 5% on average of the total amount of Community development aid since 1990.<sup>14</sup> Nonetheless, the energy projects financed under the main aid programmes (MEDA, EDF, ALA, TACIS, etc.) have produced significant results in terms of the development of this sector for many developing countries, and some specific energy programmes have been funded, e.g. the ALURE programme<sup>15</sup> for Latin America between 1996 and 2001, and the COGEN and EC-ASEAN Facility programmes in progress for Asia.<sup>16</sup> Also, the energy sector receives - and has received in the past - considerable funding from the Community development resources at the disposal of the European Investment Bank (risk capital, equity funding, loans, etc). However, the secondary nature of energy in the requests for assistance from the developing countries restricts the development of Community action in this area.

**A changing global energy situation** - The EU, and the developed countries in general, have achieved their development thanks to an energy model characterised by abundant, cheap and polluting energy. With the development of the international energy markets and climate change, this model has reached its limits. The EU has undertaken a thorough reform of its energy model, and the developing countries could benefit from this. The recent Green Paper on the security of the EU's energy supply, which calls for reinforcing the existing policies on energy efficiency and renewable energy sources, is a useful reference in this respect.<sup>17</sup>

As a result of its experience as regards networks, research, and the development of less-polluting and/or more efficient energy and all the instruments, and in particular the financial instruments, at its disposal, the European Union has a vital role to play in energy cooperation with the developing countries. The EU is also the biggest supplier of development aid in the world (over EUR 27 billion per annum), the leading commercial power in the world and a major source of direct private investment.

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This Communication first of all analyses the energy situation in the developing countries and then propose a reference framework for energy cooperation with them. A series of

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<sup>14</sup> This average masks considerable variations in the percentages for the different regions.

<sup>15</sup> ALURE is a programme for economic cooperation between the EU and Latin America in the energy sector implemented by the European Commission between 1996 and 2001. During that six-year period, ALURE made it possible to carry out 25 projects involving a hundred or so European and Latin American partners in 8 countries and 3 Latin American regions, with a Community budget amounting to EUR 32 million.

<sup>16</sup> The COGEN and the EC-ASEAN Facility programmes concern the ASEAN countries and have a budget of EUR 25 million and EUR 18 million respectively for a period of 3 to 5 years.

<sup>17</sup> COM (2000) 769 final "Towards a European strategy for the security of energy supply".

operational recommendations to implement the cooperation flow from this analysis and the reference framework.

## I. ANALYSIS OF THE ENERGY SITUATION IN THE DEVELOPING COUNTRIES

An analysis of the energy situation in the developing countries makes it possible, despite the differences in the energy balances, to distinguish broad trends, and make distinctions by groups of countries/regions and comparisons with the energy situation in the EU. This analysis clearly indicates the main challenges with which the developing countries are confronted on the energy front.

### A) Energy demand

The rate of growth in energy consumption in the developing countries is on average three to four times higher than in the industrialised countries. However, the situation varies considerably from one region and one country to another. In sub-Saharan Africa, for example, energy consumption has not risen for decades. However, Asia's energy consumption is likely to outstrip that of the OECD area in the fullness of time.

#### i) Current situation

**Energy consumption per capita** in the developing world is still far lower, about a sixth<sup>18</sup>, than in the OECD, While it has been growing fast in relative terms during recent decades, the gap in absolute terms is widening. In 1971, per capita energy consumption was 20 gigajoules in developing countries, compared with 161 gigajoules in the OECD. In 1999 it was 34 gigajoules, still far below the OECD's 194 gigajoules per capita.

These figures mask very **unequal access** to energy worldwide. In Africa, per capita energy consumption has barely increased since 1970 and remains less than 10% of per capita energy consumption in North America. In Asia, per capita energy consumption has doubled since 1970 but is still less than 15% of the North American figure. Latin American energy consumption per capita is less than 20% of North American consumption.

Energy consumption per capita is even more inequitable when viewed in terms of per capita electricity consumption. **Whereas average annual electricity consumption in the OECD is around 10 000 KWh per capita, it is only 1000 in developing countries on average, 500 in India and in several sub-Saharan African countries around 100. Less than 10% of the population of sub-Saharan Africa has access to electricity.**

The annual **growth rate** of the **total amount** of energy used in developing countries has been three or four times that of industrialised countries (4.9% as opposed to 1.4% p.a., 1970 to 1998<sup>19</sup>). This reflects much higher population growth rates in developing countries than in industrialised countries, and also industrialisation, urbanisation, increased road transportation, increased personal incomes, the shift from traditional, non-commercial energy etc. The share of developing countries in global commercial energy has increased from 13% in 1970 to close to 40% now.

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<sup>18</sup> Data and estimates in this section are from the World Energy Assessment (UN/WEC 2000). The figures in 2.1 are from WEA, Table C.1.

<sup>19</sup> WEA Table 1.1.

## ii) Present trends

According to some scenarios<sup>20</sup>, world population will rise by 34% between now and 2030, almost exclusively in developing countries. Global GDP will rise by 148%, the major driver being an almost tripling of Asian economic performance, almost matching that forecast for the OECD. Consistent with their needs, developing countries will account for 75% of the total incremental energy consumption in the world over this period – with the main contribution coming from Asia, and together they will consume more energy than the industrialised countries. Asia being by far the region with the highest share of growth will replace the OECD region as the largest energy-consuming area in the world. Behind these figures for total consumption, however, energy consumption per capita will still be very unequal between industrialised and developing worlds.

This clear trend of escalating energy demand in emerging dynamic economies, particularly in Asia, causes great environmental concern, especially because these regions are driving oil consumption, with their overall share of global oil consumption growing from 22.5% to 30.2% between 1990 and 1997. With regard to global energy and environmental economics, China concentrates essential opportunities and threats, being now the second largest energy consumer and third largest producer in the world, with high dependence on coal. In the absence of drastic measures, China will become the largest emitter of greenhouse gases within the next decades, overtaking the USA.

In all future scenarios, an important factor is **energy intensity**, the ratio of energy consumption to GDP. Historically, the energy intensity of economies has tended to rise during early phases of economic development, when industrialisation and “motorisation” of economies are strong, then peak and decline, as less energy-intensive sectors become more important. The later this happens, the lower the peak energy intensity because of intervening energy efficiency improvements. Developing countries seem to be showing the same pattern and risk making the same mistakes that Western societies made throughout the XXth Century, in particular as regards failing to control demand and making widespread use of very expensive technologies. Demand increases generally outweigh energy efficiency improvements. This has evident implications for the cost burden of energy on developing countries and for the global growth in energy use.

## B) Energy supply

The relative share of energy sources in the developing countries varies significantly compared with the figures for the EU.

Coal predominates in Asia, while in Africa renewables (mainly traditional biomass<sup>21</sup>) have a large share.

## i) Current situation

**Non-commercial energy** accounts for approximately 10%<sup>22</sup> of global primary energy use. In developing countries, roughly 30% of primary energy used is non-commercial,

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<sup>20</sup> The POLES model, a business-as-usual model.

<sup>21</sup> Biomass can only be considered to be a renewable resource when it is replaced at the same rate at which it is consumed.

<sup>22</sup> Different estimates range between 8% and 14%.



normally firewood, charcoal, crop residues and animal wastes. In some developing countries, particularly in Africa, the share may reach 80%. The technologies used with these fuels are generally very inefficient and very simple (open 3-stones fire).

The **structure of energy supply** tends to be different in developing countries from that in industrialised countries. In the developing world as a whole there is relatively greater use of coal and renewables, relatively less of oil, gas and nuclear energy. This differs somewhat among developing countries.

- Coal is by far the most prominent source in Asia accounting for 40% of total energy supply. 77% of this is used for power generation.
- Latin America relies on oil for almost half its energy supply, and three-quarters of its power generation.
- Renewables have a large share in Africa, mainly due to biomass, which represents 70% of final energy consumption for sub-Saharan Africa (or more than 80% for sub-Saharan Africa without South Africa)<sup>23</sup>.
- The little recourse to nuclear energy is concentrated in Asia (China, India, North Korea) and South Africa<sup>24</sup>.

The dependence of developing countries on imported oil has already had clear **financial implications** for them. There is a close causal link between oil price rises since the 1970 and Third World debt, much of which has its roots in the need to pay for oil imports or oil production capacity in the past. Oil price rises and instabilities have led to vicious circles, that undermine development. The close correlation between oil prices and economic growth, as diagnosed in the Commission's Green Paper, is particularly relevant to developing countries as regards their policy on security of energy supply, including policies on certain renewable energy sources. Some developing countries, in particular geographically isolated ones such as the Pacific micro-States, have to pay far more for their fossil fuels than the average world price. This has a very detrimental macroeconomic impact. Furthermore, the lack of access to appropriate financing to invest in fuel-efficient and renewable technology further increases the vulnerability of these countries.

Finally, the absence of regional cooperation and interconnected infrastructure implies that any perturbation in a given national market will have full impact locally without the possibility of being smoothed out as in the EU.

## ii) Present trends

The relative importance of oil in the energy mix of developing countries is forecast to grow, with consumption increases notably in Asia. The share of gas is forecast to increase in all regions, particularly Asia and Latin America. The developing Asia region, currently a net exporter, is likely to become a net importer by 2020. Coal consumption in developing countries is forecast to grow by almost 3% p.a. between now and 2020. It will continue to be the dominant fuel in China and India and they will account for most of the

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<sup>23</sup> Source : "Energy as a Tool for Sustainable Development for ACP countries" 1999, European Commission and UNDP.

<sup>24</sup> POLES baseline.

world's incremental coal use during this time. Coal will remain the most important source of electricity generation in many developing countries.

Nuclear power is expected to more than double its capacity in developing countries between 2000 and 2020, although from a low base<sup>25</sup>. With few exceptions these plants will be built in China and India, where the share of nuclear in electricity generation is planned to increase. For the developing world as a whole, the share of nuclear energy in electricity generation is expected to remain around 4%. Low coal and gas prices and increasing costs associated with establishing safe operations may make investment in nuclear generation not economically viable. In addition, the conditions for good long-term management and governance environments, to ensure safe operations, cannot be met by most developing countries..

Future use of biomass is difficult to predict, although it can be expected that with economic and social development, consumption of traditional biomass will decrease. With population growth, wood-fuel is becoming a scarce (and unsustainable) resource in many areas, contributing in many cases to deforestation. Improved forest management and fuel-switching for domestic use, for example from biomass to LPG, represents an opportunity for many developing countries, the latter also providing health benefits to the users due to reduced levels of indoor air pollution.

On the other hand, the cost of certain renewable energy sources – often cited as an obstacle for a higher penetration rate in developing countries in the past, has come down significantly in recent years. With the continued maturing of the renewable energy industry in Europe and elsewhere in the developed countries, this trend is expected to continue hence bringing the cost of such technologies within reach of more developing countries.

### C) Economic issues

The share of imported energy, in particular oil and gas, affects the economic development of most of the developing countries.

i) The financial implications for developing countries of increased **reliance on imported energy**, particularly oil and gas, have been very considerable. This is likely to be even more so in the future, when demand in developing countries will also have a bigger impact on oil market prices. If future global oil demand increases from present 75 mbpd to 115 mbpd, a 5 \$/barrel upward pressure on oil prices would be a modest assumption. The financial implication for developing countries however would be far from modest: an additional oil import bill around \$90 billion annually, an amount comfortably exceeding the total value of present or future worldwide development aid. Moreover, the economies of developing countries are, in general, far more vulnerable to volatile oil prices than the EU.

**This “scenario” underlines three conclusions: the EU and developing countries have a shared, growing interest in oil and gas market stability; developing countries will increasingly have a self-interest in policies promoting energy efficiency and alternative energy sources; and the present producer-consumer dialogue will gradually have to include major consumer developing countries.**

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<sup>25</sup> Source : World Energy Assessment (UN/WEC 2000).

ii) Insecurity of energy supply, as manifested for example by unreliable electricity supplies, is commonplace in developing countries. It is both socially and economically damaging. Energy insecurity discourages investment by threatening production and increasing costs due to the reserve capacity (electricity generation) required. The cost of stand-by electricity generation for small investors is particularly high<sup>26</sup>.

iii) The energy sector **investment** needs in developing countries are very substantial. Based on different scenarios, capital requirements of the energy sector in developing countries over the next twenty years are in the range of \$150 to 200 billion p.a.<sup>27</sup>. Annual investments in the electricity generation sector alone are estimated at \$70-85 billion p.a.<sup>28</sup>.

It is clear that financing of this order cannot be provided mainly by development aid or public budgets. Indeed, in developing countries, energy investments are gradually moving towards private sector financing, but private funds are not flowing into many developing countries, especially the poorest such as those in sub-Saharan Africa, for a variety of reasons, especially risk to investors. Very little foreign direct investment reaches the least developed countries. Official development assistance remains limited. Most developing countries have to finance their energy development from domestic savings and development aid. This is a much tougher task than what happened in rich countries when they subsidised the establishment of their own energy sectors (coal, nuclear) as pointed out in the Green Paper.

iv) If investment is to be attracted, not only into the energy sector in developing countries in general, but specifically into **energy efficiency** and **renewable** energy sources, a **concerted and broad-ranging effort** is required. Appropriate commitments at multilateral and bilateral level should be undertaken in order to ensure the legal certainty that foreign operators need in order to invest and operate in a country. Whilst such investments are meeting lesser obstacles in industrialised countries due to a supportive regulatory framework, they will continue to meet obstacles in developing countries unless appropriate financing and operating mechanisms are developed. Given the very real needs for increased energy supply for development in these countries, incentives must be created. The Clean Development Mechanism<sup>29</sup> is an example of an already agreed instrument but others, even more ambitious and complementary, are also needed. Whereas research and development on certain innovative technologies is hindered by a saturated market in the industrialised countries and too low purchasing power in the developing countries, instruments such as the CDM may give way to new, unsaturated markets for first investments and give incentive for further R&D on innovative renewable energy and energy efficient technologies.

#### D) The lack of institutional capacity and human resources

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<sup>26</sup> In Nigeria, around 92% of firms surveyed in the mid-1990s had their own generators. For small firms, the investment in generating capacity represented almost a quarter of their total investment, and for large firms a tenth (African Development Bank 1999).

<sup>27</sup> WEA p.356, based on WEC-IIASA scenarios.

<sup>28</sup> IEA WEO.

<sup>29</sup> The Clean Development Mechanism (CDM) is a project-based mechanism outlined in Article 12 of the Kyoto Protocol. Under the CDM, an industrialised party can earn credits, certified emission units (CERs), against its international commitments for greenhouse gas emission reduction through an approved project-based investment in a developing country. The COP-7 meeting in Marrakech in 2001 agreed on the rules and modalities of the project-based mechanisms, including the CDM, so that CDM projects can start immediately.

In many developing countries there is no real definition of energy policy. This is attributable in particular to the fact that public institutions lack adequate structures, the necessary human resources and other crucial means (such as access to complete and reliable statistics) to be able to develop such a policy. The EU has built up considerable experience of the planning and formulation of energy policies. It is therefore in a privileged position to help the developing countries develop their administrative capacities and energy policies over the long term.

In general, institutional support is intended to provide the developing countries with the means to:

- develop a more efficient public administration, relying on a educated workforce, capable of performing the tasks required of an effective public service.
- develop appropriate energy policies including a social, economic and environmental dimension. This covers the establishment of transparent regulatory structures, a pricing policy guaranteeing as far as possible that prices reflect costs at national level, subsidy levels, technical regulations, import-export practices, etc. It should be based on the availability and analysis of statistics relating to the national energy situation and the different population categories;
- implement the policies thus formulated. This includes in particular the development and establishment of appropriate institutional procedures for energy services. Institutional support should also make it possible to assess the comparative advantages of public and private services, the role of deregulation, the technological options available (in particular renewable energy sources, energy efficiency and the rational use of fossil fuels), and contribute to the emergence of (public and/or private) local capacities for the development and monitoring of projects targeted on the supply of energy services.

E) Absence of an appropriate legislative, regulatory and financial framework

The existence of an appropriate legislative, regulatory and financial framework is a precondition for attracting the private investment flows needed to develop basic energy services and infrastructures. This is mostly lacking in the developing countries.

In the majority of the developing countries, the price of conventional energy sources is artificially lowered as a result of public subsidies. This price distortion policy is an obstacle to investments in energy efficiency. The use of subsidies should be transparent, limited in time and targeted on specific social goals, as with cross-subsidies between rich urban areas and poor rural areas. The inappropriate taxation of imported energy equipment also sends a negative message to the market

In addition, in certain developing countries, inefficient and sometimes corrupt energy services drain public funds for the benefit of a minute proportion of the population. Improving the efficiency of energy services should make it possible to make better use of public resources as a result of measures aimed at restructuring and opening up services to competition.

As far as financing is concerned, the limited nature of public funds and the increasingly accepted idea of a more limited role for the State have aroused the interest of the governments of the developing countries in the mobilisation of private investment, in

particular in the context of privatisation or of opening up the capital of public enterprises. In this context, the development of a transparent regulatory framework, the reinforcement of financial intermediaries, and the development of public-private partnerships are fundamental for the mobilisation of domestic and foreign capital in the context of equity investments. In addition, income from public-private partnerships should be managed transparently and equitably.

## **II. A REFERENCE FRAMEWORK FOR ENERGY COOPERATION WITH THE DEVELOPING COUNTRIES**

The EU's energy cooperation with the developing countries has hitherto mostly been on a case-by-case basis. Also, the volume of aid allocated has remained very limited. On the basis of the above analysis of the energy situation, a reference framework should be proposed for the EU's external action in the energy sphere.

The ownership by the beneficiary countries of their development strategies is the key to the success of cooperation. This means that the energy policy and cooperation priorities are defined by the beneficiary countries/regions, by involving the largest possible number of stakeholders (public and private sectors, civil society, etc.). Consequently, development cooperation funds cannot be earmarked for specific sectors at Community level. In this connection, the EU attaches prime importance to the quality of dialogue with the partner countries, which should make it possible to ensure consistency between the national policies and the Community support mechanisms. The development priorities as a whole are set out in strategy documents for the reduction of poverty and strategy documents by country and by region. These documents are based on the "ownership" concept, and negotiated between the Community and the beneficiary countries. They define the framework within which cooperation projects and programmes, eg in the energy sector, are funded and implemented. The energy dimension of these documents has so far remained limited or even non-existent. It is desirable to deepen the energy dialogue with the beneficiary countries so as to reinforce the energy dimension.

The situation is very diverse within the developing countries. The broad lines of cooperation proposed should be responsive to the flexibility required by the diversity of energy situations and integrated in a modular fashion in the strategy documents.

### **A) General aspects**

The reform of the energy sector and technology transfer are two fundamental aspects of future cooperation activities which concern both energy demand and energy supply.

#### **i) Reform of the energy sector**

In order to meet the requirements concerning the opening-up of the market and promote private investment, an appropriate legislative and regulatory framework is necessary, in particular as regards regulation, the unbundling of activities, pricing and the promotion of private participation. In all these areas, the EU has unparalleled experience by virtue of having established the biggest integrated market in the world. This experience should be put to the benefit of the developing countries.

Apart from the formulation of energy policies and the detailed rules for implementing them, the need to reform the energy sector in the developing countries essentially concerns the following aspects:

- *Opening up production and distribution to the private sector* (in particular granting licences to independent electricity generators). Where the opening-up of markets is concerned, the EU has developed an original concept based on regulated competition,<sup>30</sup> offering a third way between pure liberalism and outmoded statism. This is of particular interest for the regions involved in regional integration. However, in the case of the developing countries there is a major financing problem which has to be resolved by devising innovative financial arrangements, and acquiring the requisite expertise, combining donations, loans and equity funding in order to reduce the risks taken by investors. The development of such funding arrangements is a challenge for the providers of finance and the international financial institutions active in the developing sector, in particular the European Investment Bank. In this context, a regulatory framework, ensuring equitable and transparent distribution of benefits is essential.

- *Pricing*: The establishment of a structured energy market calls for transparency in pricing and invoicing, for both large consumers and households. One of the major problems in this respect is that in certain developing countries some of the energy is not paid for by the users, in particular public ones. In addition, price subsidy arrangements should be revised in order to improve transparency, take account of all environmental costs and reduce distortions at market level and organise income transfers from urban areas to poorer rural areas. Where pricing is concerned, energy policy and social policy go hand in hand.

In addressing these issues in developing countries, it will be particularly important to keep the access to energy of the populations at large as a high priority for any sector reform.

## ii) Technology transfer

Technology transfer and creating the conditions for it to be effective are fundamental aspects for the energy sector. Mention should be made in particular of technologies relating to clean coal, renewable energy, nuclear safety, and equipment and appliances aimed at increasing energy efficiency.

The EU has given priority to energy efficiency and the development of renewable energy sources since the oil price increases in the 1970s and early 1980s. Much of this technology can be applied with immediate benefit in developing countries. The additional push for energy efficiency in the 1990s in order to reduce CO<sub>2</sub> emissions has demonstrated that particularly energy-efficient technology is also often economically attractive. The present development of fuel efficient motor vehicles, following the agreement between the Commission and car manufacturers is a striking example. Developing countries have all good reasons to follow suit, and with the right incentives, transferring this technology would be highly appropriate. Similarly, the development of wind energy, the most rapidly expanding electricity-generating technology in the EU, is a

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<sup>30</sup> The process of opening up the European electricity and gas markets provides for safeguards (public service obligations) to protect the final user, and in particular the most vulnerable consumers.

good example. European wind turbine manufacturers have already developed production activities in a number of developing countries, notably India.

## B) Demand-side cooperation

Apart from the absolute priority of guaranteeing access to adequate energy services for the "energy poor", demand-side cooperation is undoubtedly the most promising avenue of approach, since improving energy efficiency is a crucial area that has to a large extent not been exploited so far in the developing countries, while the EU has built up vast experience in this field.

The right and the need of the developing countries to increase their energy consumption is beyond question. However, in most cases, and particularly in the case of those countries which already have a significant industrial sector, there is a very considerable potential for improving energy efficiency, and this could be an effective way of promoting low-energy-intensity economic development. Accordingly, the developing countries should focus their efforts more on improving energy efficiency than on controlling the overall rise in demand. This is consistent with the general commitments entered into under the Climate Convention and the Kyoto Protocol.

There is a close - and unfortunate - link between the fact that developing countries have higher energy intensity in their economies and pay a bigger share of GDP for energy services. One of the ways to break this link is to give priority to energy efficiency in policy formulation and implementation.

Energy efficiency is important in energy conversion (electricity generation), distribution and end use. Measures to improve energy efficiency are usually highly cost-effective, however often with a relative high up-front investment, which takes some time to be recovered. However simple improvements in management practices, to improve operation and maintenance, can yield significant energy savings and be cost-effective.

Energy efficiency is important at all levels. Modern gas-fired electricity generation offers efficiency above 50%, and over 85% with co-generation, whereas much conventional coal-fired capacity in developing countries, operates at around 25% efficiency. Firewood stoves for cooking can be improved to greatly reduce the need for firewood and limit indoor air pollution. Appliances such as refrigerators or light bulbs come with very different efficiencies. And the impact of fuel-efficient cars on the oil import bill of a developing country can be significant.

Penetration of modern energy-efficient technology in developing countries basically requires three elements :

- Providing access to the technology for use in the production industry of developing countries ;
- Providing access to capital for the necessary (often higher) investment in energy efficiency ;
- Creating a legal and financial framework, instruments and/or economic incentives to ensure that the technology is implemented.

Leapfrogging to modern technology implies cooperation between governments, industry and financial institutions. The high priority given to energy efficiency in the EU, as

expressed in the European Commission's recent proposal for the "Intelligent Energy for Europe" programme, provides an excellent basis for cooperation with developing countries in this field. This programme, which has a limited budget, will not be sufficient, however and will complement the big Community development aid programmes (MEDA, EDF, etc.) which have more financial resources at their disposal.

C) Supply-side cooperation

i) Promoting energy diversification

The objective of energy diversification applies to both the consuming countries and the producing countries, the latter often being mono-exporters and hence vulnerable.

The purpose of energy diversification is to reduce dependence on the traditional fossil fuels such as oil and gas, whose drawbacks are well known (price volatility, limited reserves), by broadening the national/regional energy mix. The latter will be determined on a case by case basis by the countries/regions concerned depending on their specific features and their assessment of the different possible alternatives/combinations.

In this connection, three options should be examined, without any preconceived ideas about their appropriateness/relevance, which should be assessed in the light of their economic, social and environmental sustainability:

a) Coal

Coal is abundantly available throughout the world, including in many developing countries (China, India, South Africa, Colombia). It is generally a cheap source of energy and any country in the world can benefit from low world market prices for coal, likely to continue for decades.

The main drawback of coal is its environmental performance. For industrialised countries having quantified targets for greenhouse gas emissions (mainly CO<sub>2</sub>), the possible use of coal is limited. On the other hand, since this limitation does not apply to developing countries for the moment, it is generally expected that coal consumption in developing countries will increase in the coming years (decades), mainly for electricity generation.

Developing countries, however, face a number of local environmental problems, particularly air pollution, and many are also concerned about transboundary air pollution due to emission of SO<sub>2</sub>, NO<sub>x</sub> and heavy metals. Awareness is also growing that in the longer term it will be necessary also to limit coal consumption in developing countries, if the ultimate objective of the Climate Convention is to be achieved.

In view of the overwhelming importance of coal in developing countries, **clean coal technologies** must be introduced on a wide scale. Specific attention should be paid to this aspect of cooperation in order to accelerate further large-scale penetration of clean coal technologies. Clean coal technology has been developed within the EU during the last 20 years, in particular under the ECSC Treaty and the Community R&D Programme. Processes to reduce emission of SO<sub>2</sub>, NO<sub>x</sub> and particulates make it possible to burn coal in large installations with a minimum of impact on local air quality or acidification. Improved efficiency towards 50% allows significant reductions in CO<sub>2</sub> emission compared to most existing installations in developing countries. Utilising waste heat for domestic heating, cooling or other low-temperature heating purposes allows even higher



overall efficiencies. Improved inspection and maintenance of existing plants often offers low investment and highly efficient ways of improving the utilisation of coal.

Clean coal technology does not stop with the abovementioned examples. Promising future technologies include coal gasification combined with technologies to capture and store (underground) CO<sub>2</sub> which would in principle allow coal to be used in a sustainable way. However, a number of important barriers still have to be overcome, notably the high cost of capture and permanence of long-term storage underground. This is a clear example of technology development at present mainly depending on industrialised countries, but certainly with important prospects for all countries. In this respect, the possibilities of associating developing countries with the development and deployment of these new technologies should be explored.

With support from the ECSC, the EU has also developed some of the world's best mining technology. Transferring this technology could lead to improvements in the efficiency of coal production in developing countries. Standards of safety in the coal industries of some such countries are low, as is demonstrated, for example, by a recent series of mine disasters in China. In this respect too, ECSC programmes have supported the development of a wealth of readily-transferable technology which could help to improve not only safety, but also standards of health and working conditions

The example of China, however, demonstrates the muted commercial interest on the part of European industry to export these new technologies for lack of an overall framework ensuring financing and genuine exploitation of technology transfer.

#### b) Oil and gas

Both oil and gas are expected to increase considerably in the energy mix in developing countries. In the case of oil, the main reason is increased use in the transport sector, where for the time being alternatives are limited. In the case of natural gas, the increased use is often linked to the need for improvements of environmental conditions, particularly urban air pollution. However, natural gas is also an attractive fuel from the climate change point of view because it can be used with high efficiency and it has lesser carbon content than the other fossil fuels.

Both oil and gas are foreseen to be in limited supply in the medium term. This, as well as the potential implication for climate change, calls for use of oil and natural gas in the most efficient way as previously mentioned in connection with energy efficiency. In addition to this, use of oil products requires appropriate environmental measures whether heavy fuel oil used in combustion plants or gasoline and diesel used for transport purposes. Part of the clean coal technology, such as flue gas desulphurisation is equally useful when burning oil products.

#### c) Renewable energy

While the potential of renewable energy is increasingly being vaunted on account of its benefits from the point of view both of the environment and of security of supply, its share will remain limited, especially as, in the absence of specific policy measures, such as those taken by the EU to promote renewable energy, in general the high cost of renewable energy is an obstacle to its expansion, at least in the short term.

For the European Union, renewable energy production should double by 2010 from 6% to 12%. This would be achieved through very high investments, particularly in the

electricity sector where the share of electricity produced on the basis of renewable energy should reach 22% by 2010 according to the Directive on the promotion of renewable energy.

Use of renewable energy in developing countries is often much higher than in the EU, but mainly based on firewood for cooking and heating (traditional biomass), or on big hydro-electricity plants. Both can have drawbacks from the point of view of sustainable development. Excessive collection of biomass is a threat to sparse and vulnerable forest cover in many semi-arid areas and use of that biomass is the cause of serious health problems due to high levels of indoor air pollution. Big hydro-electric schemes have been the subject of much environmental concern, with the result that few projects are likely to advance in the coming years.

**As total energy demand in developing countries will increase and the use of firewood should be replaced by more sustainable energy sources, the share of traditional biomass in these countries (and globally) should show a decrease over the medium to long term. It will require a significant effort to introduce modern renewable energy sources (e.g solar, wind, small hydro, sustainable biomass, etc) at a rate sufficient to maintain the present overall share of total renewable energy, both globally and in developing countries (see Table II in Annex).**

**These perspectives are important for the evaluation of the future role of renewables in the energy supply pattern of developing countries. They stress the importance of a diversified energy supply structure. They also show that it would be a mistake to believe that the solution to the expected increase in energy consumption in developing countries would primarily be found in renewable energies, whose cost is for many of them currently out of reach. However, with adequate energy policies in place, locally available renewables could be competitive, in particular for decentralised electricity production, and be in a position to make a significant contribution to the developing countries' current energy needs, in particular taking into account current trends, which indicate that the economics of renewable energy will improve for developing countries, as a result of cost reductions through increased use in developed countries.**

The potential as regards renewable energy lies in particular in rural areas where access to energy depends on decentralised electricity generation. Recent and possibly future developments, in particular wind and solar energy, offer potentially promising contributions to energy supply **in rural areas**. Rural areas are often too sparsely populated or have a too low potential electricity demand to justify the investment in electricity transmission and distribution of centrally generated electricity. Locally produced electricity from wind or solar power may offer the best solution to cover basic energy needs for light, communications, health services and initial production and commercial development. This aspect is particularly important in the context of poverty eradication. If properly integrated in rural development policy, renewable energy will also contribute to improving life in rural areas, thus hopefully contributing to reducing the incentives for migration from rural to urban agglomerations with all the associated social problems.

For the abovementioned reasons of security of supply and environmental protection, it makes sense to support developing countries through:

- assistance to promote the necessary technical capacity;

- supporting efforts to establish the necessary regulatory framework and institutional capacity to promote the use of locally available renewable energy sources;
- providing improved access to renewable energy and energy efficiency technology as developed by EU industry. RTD efforts deployed in the EU should address the constraints to using these technologies in non-industrialised countries or in remote rural areas. The demonstration of these technologies in real (developing country) conditions should not be neglected either;
- developing appropriate financial mechanisms to promote renewables.

d) The nuclear option

A number of developing countries (eg: China, India, South Korea, Taiwan, South Africa) are pursuing nuclear energy as part of their overall energy mix.

The European debate on nuclear power has clearly demonstrated the necessity of high safety standards and environmentally safe treatment and deposition of nuclear waste.

Safe use of nuclear power requires a high level of technical and managerial skills; broad understanding and acceptance of the issues by the general public is also necessary for sustainable use of nuclear. Without a guarantee of long-term good governance, the safety of nuclear power use cannot be ensured, both from nuclear contamination and terrorism points of view. While experience in the European Union has shown that with the required skills and governance use of nuclear power is technically possible, such a combination of factors are absent in most developing countries.

Achieving good governance and political stability, while a major objective of EU development cooperation is a long-term process.

In developing countries, it is generally understood that public finances will not be sufficient to provide energy services to those without, and it will be private capital that will underpin their future energy need. The private sector is reluctant to take on the risk and liabilities (safety, waste disposal, etc.) of new nuclear capacity in developing countries, even when it is proved to be economically competitive.

Where developing countries have nonetheless opted or are opting for nuclear energy, and where this is consistent with a national strategy promoting sustainable development, and sufficient safeguards exist, the EU may provide technical assistance for establishing and implementing the necessary regulatory framework and institutional capacity to manage nuclear energy safely, including control of nuclear materials (safeguards), waste management, and the safest technologies..

ii) Facilitating the development of networks, and in particular interconnections

The European energy market is moving towards a single integrated energy market. This development has been made possible through the close political cooperation within the EU, particularly the establishment of the Internal Market, and through the development of an extensive network of energy supply infrastructure which allows full exchange of gas and electricity, in particular, between Member States.

Development of regional energy infrastructure can offer benefits of economies of scale, especially with small countries, where there is potential for reducing transaction costs

and increasing competitiveness through the sharing of the development, management and operations of energy infrastructure facilities. Such opportunities exist for shared facilities in gas and electricity infrastructure and trade. Electricity pools can significantly reduce expenditure on new generating capacity, as well as operating costs, and can help to enhance energy security<sup>31</sup>.

It is however important to recognise that the benefits of regional cooperation and infrastructure investment are heavily dependent on local circumstances. The European market is characterised by a high consumption in a relatively small area. Many developing countries have a low consumption over big areas, a situation that favours an energy supply system based on local production. However, some regions lend themselves to the development of regional cooperation on account of their size, population density and distribution of energy resources. This is the case, for example, with the Mediterranean region where the energy distribution system is still very limited. The development of genuine energy cooperation between the 12 Mediterranean partners would make it possible to resolve most of the problems of the region where energy is concerned.

Many potential large hydropower projects in developing countries, apart from the environmental impacts, often have high transmission and distribution cost to bring the electricity to potential consumers. Whereas there is no obvious solution to the lack of economic feasibility because of insufficient demand or too high distribution costs, there are solutions to overcome political or institutional barriers to regional energy cooperation. There is reason to believe that many regions in the world (South America, West Africa, sub-Saharan Africa, South East Asia) can benefit from a closer cooperation on energy supply systems. Such cooperation will also be particularly useful in the case of renewable energies with varying availability. Hydropower, or wind energy only deliver their full supply benefits if they are combined with energy sources that do not depend on weather fluctuations. In this respect, the approach to electricity grids in developing countries should be adapted to a future, more decentralised energy production, using dispersed and intermittent resources, such as renewable energy

Moreover, it should be noted that energy cooperation is not necessarily linked to infrastructure-based energy exchange. Capacity-building and exchange of experiences can be shared on a regional basis by countries with modest energy demand (Africa, Pacific Islands).

It is also worth stressing that the role of energy networks in securing reliable and affordable energy supply is not only an international problem. Many developing countries struggle with the challenge of establishing purely national grids (gas in Nigeria, electricity in China and in Iran) to provide basic energy services in areas where the demand is modest. These efforts deserve to be supported as part of national poverty eradication schemes and also as a crucial element for improving conditions in rural areas.

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<sup>31</sup> It is estimated that pooling electricity generation facilities in Southern Africa could generate savings of \$80 million per annum in operating costs and \$700 million in expansion costs over the next 20 years.

### III. THE MEANS TO BE DEPLOYED: OPERATIONAL RECOMMENDATIONS

With a view to the Johannesburg Sustainable Development Summit, a **European Union Energy Initiative in the developing countries** should be launched in order to give a political boost and a very concrete dimension to cooperation in this area. More generally, this Initiative is part of a series of across-the-board proposals for the long term aimed at helping to improve the effectiveness of energy cooperation with the developing countries.

This energy cooperation with developing countries should draw on the EU's own long experience with the environmental problems arising from the use of conventional energy and recognition of the need for a more innovative approach to securing affordable and sustainable energy sources, thus focusing on sharing solutions that are energy-efficient and do not waste energy or which harness renewable energy while not comprising the need for developing countries to have access to basic energy services.

#### A) Recommendations for the long term

**a) Integrating energy as a general component of EU development aid programmes** – It is important that energy should occupy a place within EU development cooperation reflecting its cross-sector dimension and its role as a precondition for the reduction of poverty. Given the anticipated rise in the overall volume of development aid in the next few years it would be desirable for it to have a significant beneficial effect on energy cooperation. Where the EU development aid programmes are concerned, it is necessary that, on the basis of the requests from the beneficiary countries/regions, the share of energy in the overall annual volume of development aid should increase significantly in the medium term.

The means of achieving this objective may vary depending on the programmes or countries/regions concerned, entailing an increase in the number and/or size of energy projects or the introduction of an energy component in sectoral projects concerning education, health, water, etc. The integration of energy into poverty reduction strategy papers (PRSPs), defined by beneficiaries, is important in that regard. This will first of all necessitate making the beneficiary countries more aware of energy questions, if the beneficiary countries/regions so wish, by adjusting the indicative national and regional programmes which form the basis for cooperation between the EU and the developing countries. This concern already seems to have been taken on board by a number of developing countries. In addition, development aid programmes and projects in the energy sector should systematically include energy efficiency objectives.

**b) Developing institutional support, technical assistance and networking to give the beneficiary countries the capacities to implement their energy choices** - The formulation and implementation of energy policies, in particular the requisite regulatory framework to promote investment, the diversification of sources of supply and the rational use of energy, require a high level of expertise which, for the most part, is very limited in the developing countries.

Given the numerous studies already funded in the past, it is proposed that, for the countries/regions which so desire, all or part of the financial assistance available under the EU's development aid programmes should be concentrated on twinning operations. On the basis of extremely good results and experience in the Central and Eastern European candidate countries, this would make it possible to second European experts to

the beneficiary countries. These secondments would be of limited duration but sufficiently long (one to three years) to strengthen the administrative capacities of these countries and make concrete progress in terms of the regulatory framework, the energy balance and the diversification of supplies, as well as financial mechanisms for the deployment of energy production capacities and networks. Moreover, *ad hoc* technical assistance mechanisms should be envisaged, as well as support for existing national/regional energy centres. Support to training will also make it possible to contribute in the medium term to the formation of a competent pool of energy professionals in the developing countries.

Furthermore, the EU has a vast network of local and national agencies responsible for energy matters, in particular the promotion of renewable energy and energy efficiency. Consequently, it is proposed that some of the EU funds available for international cooperation should be devoted to the networking of EU energy agencies and equivalent centres (already in existence or to be set up) in the developing countries. The EU Intelligent Energy for Europe programme could act as a catalyst in this connection.<sup>32</sup> Given the need to ensure a proximity policy responsive to the very varied specific needs of the developing countries, local centres will be strongly encouraged. This sort of networking will make it possible to reach the largest possible number of stakeholders, both public and especially private (civil society).

**c) Developing an appropriate regulatory framework and innovative financial mechanisms in order to promote investments in clean technologies in the context of public-private partnerships** - Investing in clean technology is first and foremost the responsibility of industry and it is vital that the market and investment conditions in the developing countries should be such as to encourage the involvement of enterprises in the technology transfer process. In many cases, the economic viability of clean sustainable energy investments is not yet sufficient for private capital investors without flanking support measures, including the provision of public funds in the form of equity, grants or subsidies. This problem is accentuated by high up-front capital investment costs although this is compensated by low operating costs in the longer term.

A regulatory framework and appropriate public funding (own resources and development aid) therefore have an important role to play in this area, particularly as a means of mobilising private capital. Mention should also be made in this connection of the Community's technological research activities, in particular under the 6th Research Framework Programme which will be open to all third countries, including developing countries, and will offer exemplary energy partnership possibilities. The development of such partnerships should also make it possible to mobilise additional banking sector funding. With support from the EU Energy Initiative (cf. §B), this should make it possible to analyse the needs of the beneficiary countries in terms of innovative funding arrangements and help to develop such mechanisms combining the expertise and sources of funding available (donations, loans, equity funding).

**d) Encouraging regional cooperation**

Regional (and subregional) cooperation on energy can generate genuine added value in the developing countries with a view to sustainable development. The problem is that the

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<sup>32</sup> The Intelligent Energy for Europe programme includes an international cooperation dimension (COOPENER) to which the European Commission proposes to allocate EUR 19 million for the period 2003-2006.

size of the national markets is insufficient to stimulate private investment, whereas most of the energy distribution problems can be resolved on a regional scale. The development of regional cooperation can stimulate and facilitate the implementation of reforms in the energy sector and the involvement of the private sector. Likewise, the development and interconnection of energy distribution networks at regional level should make it possible to improve access to energy and the security of supply of the populations concerned.

Given its experience and the instruments at its disposal, the Community should lend its support to the efforts of the developing countries who wish to embark upon this path. In this connection, it can rely on the regional dialogue as well as the regional dimension of cooperation under the big development aid programmes. With regard to the regional energy dialogue, the role of the existing fora should be strengthened (e.g. Euro-Mediterranean Energy Forum, Asean Centre for Energy, etc) as fora for information, awareness-raising and the discussion of energy policy issues. A detailed regional dialogue can generate regional integration projects concerning energy, as with the Mediterranean Electricity Ring Project<sup>33</sup>.

**e) Developing coordination within the EU and with other international providers of finance and organisations** – While good coordination is essential as between the Community cooperation instruments, it is also crucial to have good coordination between the Commission's energy cooperation activities and those of the Member States. The reference framework proposed in this communication should generally contribute to this, as should the EU Energy Initiative (cf. §B) more specifically.

At international level there are many fora which address the question of energy in the developing countries, but in a rather dispersed or compartmentalised manner. Mention should be made in particular of the United Nations (UN Development Programme, UN Environment Programme), the World Bank, the International Energy Agency, G8, and the World Energy Council. Generally speaking, it would be desirable for the dialogue with the organisations responsible for energy coordination to be stepped up at international and, especially, at regional level. For example, in the case of Latin America, OLADE (meeting of the Energy Ministers), ECLAC (United Nations Regional Economic Commission) and the IDB (Inter-American Development Bank) have lengthy experience in this connection, and there is dialogue between these organisations and the European Commission. Strengthening the coordination shall also be beneficial concerning the poverty reduction strategy papers. A single focal point for the analysis and management of statistics concerning the energy situation in the developing countries would be particularly useful. It is desirable that an existing international organisation with the requisite experience should play this role. In particular, consideration should be given to the role that the International Energy Agency could play in this respect.

The EU Energy Initiative will provide an additional opportunity to improve the coordination of EU action with that of other international donors.

## B) The EU Energy Initiative

In order to promote cooperation between the EU and the developing countries in the energy sector, and taking into account the long-term actions mentioned above, in Johannesburg the EU will launch an EU Energy Partnership Initiative. The Initiative was

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<sup>33</sup> The Mediterranean Electricity Ring Project is one of the six MEDA regional projects in progress in the energy sector.

already announced in the Commission communication on the external dimension of sustainable development (COM (2002) 82, February 2002):

“Adopt in 2002 a European Union initiative on cooperation in the field of energy and development within poverty eradication efforts, with a particular focus on the provision of reliable sources of energy, improved energy efficiency, including energy savings, clean technologies and development of renewable sources, including capacity and institution building.”

The Member States confirmed their support for this proposal in the Council Conclusions adopted at the Development Council meeting on 30 May 2002.

“The EU will be developing and launching at the WSSD an energy initiative with a particular focus on poverty eradication by improving access to adequate sustainable energy services in rural, peri-urban and urban areas, through the full menu of technical and institutional options, including rural electrification, decentralised energy systems, increased use of renewable energy (such as hydropower,<sup>34</sup> tidal energy, wave energy, wind power, biomass, solar energy or geothermal energy), and enhanced energy efficiency (including cleaner, more efficient fossil fuel technologies, technology for more efficient appliances and the more efficient use of traditional biomass).

Through the development of partnerships, the core of the initiative will be the provision of support for institutional capacity-building, and technical assistance to developing countries to put in place adequate energy policies. Development Banks, investors and the private sector will be invited to participate in the financing.”

The Seville European Council of 21-22 June 2002 reiterated the Council Conclusions and specified that the EU would pay particular attention to Africa when implementing the Initiative in order to give a boost to the NEPAD Initiative. However, the Initiative will be open to all developing countries and could develop on a regional basis.

The objective of the Initiative is outlined in the Development Council Conclusions of 30/05/2002:

“The EU reconfirms its firm commitment to: Facilitate the achievement of the Millennium Development Goal of halving the number of people in extreme poverty and other MDGs by 2015, through the provision of adequate, affordable, sustainable energy services.”

Activities, which may be either nationally or regionally based, will be developed through dialogue with partners. The benefits of regional activities in particular should be considered. Key partnership activities under the initiative could include: institutional capacity-building, transfer of knowledge and skills; technical cooperation; market development, including facilitating adequate forms of public-private partnerships, and facilitation of cooperation with financial institutions, in addition to taking a cross-sectoral approach to energy.

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<sup>34</sup> If compatible with the principles of Integrated Water Resource Management, as promoted through the EU Water Initiative, which will also be launched in Johannesburg.



The Initiative will encourage partnerships between governments and the organisations responsible for development and energy in the developing countries on the one hand and their counterparts at the European Commission and in the Member States on the other. Relevant and/or interested financial institutions and private companies will be invited to participate in the Initiative, together with NGOs. The Commission is ready to help set up a small secretariat to ensure coordination of the Initiative. The Commission will enhance mechanisms to ensure coherence of and coordination between the various instruments and programmes involving energy in the different developing countries/regions

In view of the voluntary nature of the Initiative and the need to incorporate activities into the national development programmes, success will depend to a large extent on the developing countries themselves. In the dialogue with them, special emphasis should be given to the potential contribution that energy efficiency and energy demand management as well as renewables can make to the development of their energy systems. The EU Energy Initiative should promote the mobilisation and combination of the funds available and, as far as possible, taking into account the existing implementation mechanisms, result in an increase in the proportion of development aid devoted to the energy sector. The scale of EU development aid justifies launching a specific EU Energy Initiative. This does not, however, in any way rule out EU support for any other initiative pursuing similar or comparable objectives at national level or in the context of the United Nations.

Annexes

Energy consumption of world regions as a proportion of the world total

	<b>Africa</b>	<b>Asia</b>	<b>Latin America</b>	<b>Middle East</b>	<b>CIS</b>	<b>Central and Eastern Europe</b>	<b>Other OECD</b>	<b>EU15</b>	<b>World (Mtoe)</b>
<b>Total</b>	5 %	23 %	5 %	4 %	9 %	3 %	36 %	15 %	9553
<b>Solid fuels</b>	4 %	37 %	1 %	0 %	8 %	5 %	34 %	10 %	2126
<b>Oil</b>	3 %	18 %	6 %	6 %	6 %	2 %	42 %	17 %	3417
<b>Gas</b>	2 %	7 %	4 %	8 %	23 %	3 %	36 %	16 %	1995
<b>Electricity</b>	3 %	17 %	5 %	3 %	7 %	3 %	44 %	18 %	1014

N.B. 1 : Situation in 1999, the last year for which figures are available, except for electricity (1998).

N.B. 2 : How to interpret the table: e.g. the oil percentage for Africa (3%) is the proportion of world oil consumption accounted for by Africa (i.e. 3 % of 3 417 Mtoe).

## Renewable energy consumption and forecasts for 2030

	North America	Latin America	EU 15	North Africa and Middle East	Sub-Saharan Africa	Central and Eastern Europe	Former Soviet Union	South Asia	South East Asia	China	Pacific OECD	WORLD
<b>2000</b>	5 %	23 %	6 %	2 %	62 %	6 %	4 %	39 %	16 %	17 %	4 %	12 %
<b>2010</b>	5 %	23 %	8 %	1 %	43 %	5 %	4 %	22 %	13 %	10 %	4 %	10 %
<b>2020</b>	5 %	20 %	8 %	1 %	29 %	5 %	3 %	14 %	9 %	8 %	4 %	8 %
<b>2030</b>	5 %	18 %	9 %	1 %	21 %	5 %	3 %	9 %	7 %	6 %	4 %	7 %

N.B. 1 : Source: PRIMES model (for the EU) and POLES model (unpublished results) according to a business-as-usual scenario.

N.B. 2 : The percentage indicates the proportion of energy consumption from renewable energy sources.