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ENERGY FOR THE FUTURE:
RENEWABLE SOURCES OF ENERGY

Green Paper for a Community Strategy

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Executive Summary

The European Union's current energy situation calls for effective management of all available resources in order to attain Community objectives. A well balanced fuel mix, in which all appropriate energy sources play their proper role, is essential to support sustainable economic growth. Renewable sources of energy are currently unevenly and insufficiently exploited in the European Union. Although the potential is significant, renewable sources of energy make a disappointingly small contribution of less than 6% to the Union's overall gross inland energy consumption. European Union energy consumption is predicted to grow steadily in the future. Even a significant increase in the use of renewable energy sources, as pleaded for in this Green Paper, will not be enough to satisfy the expected demand. If, therefore, the Community does not succeed in attaining a significantly higher share of renewable energy in its energy balance, it will become increasingly difficult to comply with the international commitments concerning environmental protection. Secondly, failure to increase the share of renewable energy sources will have negative effects on other important policy objectives, in particular security of supply, economic and social cohesion, and - at least in the medium to long term - economic competitiveness.

The present Green Paper constitutes the first phase of a two-step approach to develop a strategy aimed at ensuring a greater use of renewable sources of energy. The establishment of a Strategy for Renewable Energy Sources was foreseen in the Commission's White Paper "An Energy Policy for the European Union" and specifically included in the indicative work programme attached to that document. The present Green Paper describes the current situation, the advantages of an increased use of renewables vis-a-vis Community objectives, and sets out the basic elements of a policy strategy to be implemented at both Community and Member State levels. The Green Paper reinforces the strategic aim of promoting renewable energy sources as an integral part of energy policy and a number of other policies and sets the objective of doubling the contribution made by renewable energy sources to the European Union's energy balance by 2010.

The level of exploitation of renewable energy sources varies significantly between the Member States. These variations are due to different geographical and climatic conditions in the Community as well as differences in the policies which have been put in place in support of renewable sources of energy. Technological development in the field of renewables has, in recent years, been significant and many of the technologies either are, or are becoming, economically viable, in particular in certain regions of the Community and compared to the economies of other decentralised energy applications. Nevertheless, due to market failures and other obstacles, renewable energy technologies still have difficulties in "taking off" in marketing terms.

Renewable sources of energy should be actively promoted for a number of reasons. Development of renewables goes hand in hand with the objective of protecting the environment and reduce CO₂ emissions from the energy sector. Renewable energy sources are indigenous sources of energy and can therefore contribute to reducing dependency of

energy imports. Development of renewable energy sources can actively contribute to employment creation, and deployment of renewables is an important aspect of regional development with the objective of achieving greater social and economic cohesion between the regions of the Community. Moreover, the expected growth in energy consumption in many third countries, in particular Asia and Africa, and which to a large extent can be satisfied using renewable energy, offers hugely interesting business opportunities for EU based industries which in many areas are world leaders as regards renewable energy technologies. Finally, the general public favours development of renewables more than any other source of energy mostly for environmental reasons.

Under the prevailing economic conditions, a serious obstacle for a greater use of certain renewables, has been the cost associated with their exploitation. Although the cost curve for most renewables is dropping rapidly, the use of renewables is in many cases hampered by higher capital cost than those related to conventional fuel cycles. This is particularly the case due to the fact that fuel and energy prices currently do not reflect the full cost, including the external cost implied for the society for the environmental damage caused by the use of conventional and fossil fuels. Secondly, a significant obstacle is that renewable energy, technologies, as is the case for many other innovative technologies, suffer from lack of confidence from investors, governments and users, low levels of knowledge about their technical and economic potential and a general resistance to change and new ideas.

To counteract these obstacles, it is, in this Green Paper, proposed to implement a policy strategy consisting of four distinct elements.

Firstly a clear ambitious, and yet realistic, increase in the contributions of renewables to the Community energy balance should be aimed for at Community level. If we were to double the contribution by 2010 compared to the current level, this would mean achieving a contribution by renewables to the gross inland energy consumption close to 12%. An ambitious objective provides the necessary means for focusing the minds of decision makers at all levels and enables a continuous monitoring of progress with a view to rectifying or adjusting policies.

Secondly it is proposed to strengthen Member State co-operation on renewables. To achieve the target; strong policies will have to be implemented at national level and it is necessary to have a mechanism for coordinating efforts at Community level. The Commission's recent proposal for energy policy co-operation around agreed energy policy objectives, one of which is effective promotion of renewables, is an important instrument in this respect.

Thirdly it is suggested that the Community reinforces its policies affecting development of renewable sources of energy. The provisions of the Treaties and the internal market requirements offer substantial opportunities for the promotion of renewable energy sources. Moreover, given the fact that cost currently constitutes the largest barrier to a more widespread use of renewables the policy instruments must address in particular this problem. Internalisation of external cost is a key concept in this respect, to which the Commission

remains committed. Accompanying measures, including continued and strengthened policies and support for Community RD&D, training actions, awareness building, pilot schemes etc. must be continued and reinforced.

As policies in other areas than energy, including external affairs, agriculture, regional policy, fiscal policy etc., also have a major impact on the conditions under which renewables are developed, it is fundamental to the strategy that these policies facilitate the development of renewable energy sources. It is also important that the coordination between the decision-makers in the various fields is improved.

The fourth element of the strategy is a proposal for a strengthening assessment and monitoring of the progress towards achieving our objectives for the penetration of renewables.

The aim of this Green Paper, as the first step in a two-step approach, is to stimulate wide consultations and discussion with all interested parties and the Community Institutions. This document sets out a broad framework, but does not make detailed proposals. On the basis of the conclusions that the Commission will draw from the wide debate, a more detailed Community Strategy with an Action Plan will be established by mid-1997.

1. Background

Introduction

In energy policy, there are no simple solutions, no one energy source that will solve all problems, that will be limitless, pollution-free and cheap.

Energy policy since the first oil crisis in the 1970's has built up incrementally, one step after another. Energy policy priorities have evolved. In 1973, the issue was energy security and safeguarding our economies from external energy developments beyond our control. Better energy planning techniques were developed and comprehensive energy policies and programmes, combining a variety of instruments, were set up. The second oil shock in the late 1970's was a reminder of the need to stay vigilant in terms of energy security.

In the 1980's environmental issues rose to the fore. Concerns over acid rain or greenhouse gases reached their peak at the UN Rio Conference in 1992. With energy prices (primarily oil) dropping in real terms environmental concerns raised new issues. It became generally accepted that the present energy system, from extraction through to use, is responsible for much of our man-made climate change problems, and that energy consumption can result in irreparable damage to the global environment. How to re-orient our energy systems without facing a potential new collapse of our economies became and remains a major challenge.

With the economic recession setting in at the end of the 1980's, the energy sector became an important element in the Community's strategy to establish an internal market as a response to increased competition and globalisation of markets. Although the internal energy market process has been a long and difficult one, important progress has by now been achieved. Agreement has been reached in the Council of Ministers on the first phase of liberalisation of the electricity sector and negotiations on liberalisation in the gas sector are well under way. This will lead to significant changes to the way in which large parts of the European energy system is functioning. It will gradually bring market forces into play in sectors which for too long have been under government control and based on monopolies and central planning. The energy sector will nevertheless keep its specific characteristics. As a sector of strategic importance to the overall well-being of the economy, the necessary element of public service will be preserved. But winds of change are blowing.

The European Union does not have an over abundance of cheap, clean and reliable conventional energy resources. Dependence on imports is considerable. This does not mean that the Community is energy resource poor. The Union has reasonable supplies of oil, coal, natural gas, nuclear and considerable potential for renewables. They all have their strong points and their weaknesses. But it is certain that the resources have to be managed well in order to support all Community objectives.

