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**Economic, social and political issues  
facing renewable energy applications in the industrialised countries (1991)**

Economic, social and political issues  
facing renewable energy applications  
in the industrialised countries

keynote address

given by

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Environment, Nature Conservation  
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on the occasion of the  
2nd International Solar Energy Society  
Roundtable

Rome, 30 - 31 October 1991

Ladies and gentlemen,

It was with pleasure that I accepted your invitation to take part in the 2nd Roundtable of the International Solar Energy Society. On the one hand I believe that we should use the favourable conditions offered by the Earth Summit to be held in Rio in June 1992 to advance the cause of renewable energies. On the other hand I believe that it is urgently necessary to pool our resources so that renewable energies acquire a lobby as powerful as that of traditional forms of energy in order to articulate and push their interests in a more effective way than has been the case in the past. And finally, as someone responsible for environmental protection and as the initiator of the German CO<sub>2</sub> reduction programme with which the Federal Republic of Germany has set itself the objective of reducing CO<sub>2</sub> emissions in Germany by between 25 and 30% by the year 2005 in relation to the emission volume of 1987, I believe it is extremely important to expand the contribution of renewable energies to cover future energy need as soon as possible.

I am particularly glad that this roundtable is to deal with problems which prevent the wider use of renewable energies in industrialised countries. One facet of the problem of renewable energies is, I believe, the fact that international conferences on renewable energies and the discussion of the future potential of these energies to cover energy need almost always concentrate only on the developing countries. As early as in 1981, during the implementation of the Nairobi Programme to promote renewable energies, the developing countries held the suspicion - a suspicion which indeed cannot completely be denied - that the industrialised countries wanted to continue to secure as large a per-

centage as possible of traditional forms of energy by making renewable energies palatable to the developing countries as future energy sources. For this reason renewable energies - rightly or wrongly - left many representatives of developing countries with a rather nasty aftertaste. These were seen as second best technologies the use of which was designed to prevent them from using the "high-quality", tried-and-tested forms of energy traditionally used in the industrialised countries.

In fact, this should set us thinking when today the "magic word" technology transfer, designed to overcome the increasing gulf between the industrialised countries and the developing countries, is also applied to renewable energies. Improving the transfer of technology which is a central demand of developing countries at all international conferences and in particular too in the UNCED process, is based on the assumption that the level of technological development is higher in the industrialised countries and that the developing countries want to enjoy the fruits of this higher level of technology by means of the transfer of relevant information, technologies, vocational capabilities, possibilities for research, and capital resources. If we look at the level of development of renewable energies in the industrialised countries, it is hardly possible to speak of any transfer of technology and knowledge in view of the lack of testing and lack of wide-spread availability of these technologies. One could rather exaggerate and say that, as regards the domestic use of renewable energies, industrialised countries are at the same level as developing countries. Even if in many ways the points of departure for the use of renewable energies in the developing countries may well be more favourable,

there is a great deal to be said for the thesis that any breakthrough of renewable energies must also, and indeed in the first place, take place in industrialised countries.

In discussions on the requirements of the industrialised countries, the organisers of this roundtable want, I believe rightly, to concentrate on the economic, social and political implications - but not on technical aspects. From a technical point of view, a great many technologies designed to use renewable energies are even now ready to go on the market. In reply to an interpellation from members of the German Bundestag on promoting and using renewable energy sources in the Federal Republic of Germany, the German Federal Government confirmed that most renewable energies are ready, from a technical point of view, to go on the market. This is true, for example, for solar absorbers, solar collectors, solar-thermal electricity production, the passive use of solar energy in buildings, photovoltaic electricity production, the use of wind energy in small and medium-sized power stations, small and large hydroelectric plants, the incineration, gasification and biological alcohol use of biomasses, together with the use of geothermal resources.

What is preventing this potential from being tapped on a wide scale obviously then lies with the economic, social and political framework. It is impossible for me to give a detailed analysis of every individual aspect of this framework. But rather I should like to make a few comments from a German point of view, which I hope will be useful for your future discussion. I shall look at how renewable energies are treated in the Federal Government's CO<sub>2</sub> reduction programme and on the relevant results of the enquête com-

mission set up by the German Bundestag on preventative action to protect the earth atmosphere. First of all allow me to make a few remarks on the available estimates for the potential of renewable energies.

Estimates of the potential for renewable energies

It is a truism to point out that both entrepreneurial action and political strategies are based on the assessment of probable future developments. Scientific institutes which can make forecasts for future development are therefore in high demand. Because of the importance of forecasts of this kind for political decision-making and the readiness of firms to invest, it is useful to refer to some of these assessments. At the very outset, however, I would like to point out the problems such forecasts pose, problems which, I believe, lie in the fact that the results of the forecasts are based on premises of those who develop such forecasts, premises which cannot be determined scientifically

The 14th Congress of the World Energy Conference which was held in Montreal in 1989, came to the following result with regard to the future potential of renewable energy source:

"From a realistic point of view, we must recognise that additional and renewable sources of energy will, in the near future hardly play a greater rôle in meeting future energy need."

In the answer to the interpellation of members of the German Bundestag which I mentioned before, the German Federal Government points to forecasts made by energy utility

firms, for example, an 1988 Esso Study which puts the percentage of renewable energies used in primary energy consumption in the Federal Republic of Germany at 2% in the year 2000 and a similar Shell Study made in 1987 which put this figure at between 3 and 4%.

In its answer, the Federal Government does not adopt these forecasts as its own, but rather points out that in the long-term it is possible to increase provision of this kind if

- prices of conventional energy sources increase,
- further technical progress by means of research and development makes renewable energies cheaper,
- an increased environmental awareness on the part of the consumer leads to a situation where higher costs are acceptable if an energy source is consistently environmentally friendly.

In the same answer, the Federal Government points out that it does not believe that economic developments can be predicted exactly and therefore takes energy forecasts to be an aid to establish tendencies and scales of future energy demands.

In fact, within the framework of the CO<sub>2</sub> reduction programme which was passed by the German Federal Government on 7 November 1990, the Federal Government has set itself an ambitious aim wholly irrespective of these forecasts. The programme provides for between 4 and 6% of energy provision in the Federal Republic of Germany coming from renewable

energies by the year 2005. At the same time it is pointed out that in spite of the relatively low percentage which can be reached in the short time left until 2005, intensive efforts are necessary even today in order to achieve the estimated much higher contribution of renewable energies in the 21st century in the medium and long-term.

This declaration of political intention lies at the heart of the problem. It is that the destiny of renewable energies is not dependent on individual factors. Political decisions and political processes are, in a pluralist democracy, dependent on many influences, both economic and social, and can at the same time be changed by an alteration of the political framework. What we are dealing with here is cutting the Gordian Knot, requiring the crucial will to give a clear direction to the action of the individual sectors involved.

Where do the difficulties lie?

In the industrialised countries we get our electricity from wall sockets and it comes at an acceptable price. Our heating requirements and the energy required to cover our mobility requirements are provided in such a way that the individual consumer is hardly at all confronted by the consequences of his behaviour. This separation between the functions of energy supply and energy demand is the real problem surrounding the spread of renewable energy in industrialised countries. Those responsible for energy supply judge renewable energies against the costs of traditional energy forms and against short-term economic success. In general the energy consumer is in agreement with traditional energy provision as long as he enjoys the economic and practical advantages it has.



In the analyses made on the potential for the use of renewable energies possible to cover energy requirements and the relevant energy forecasts, great importance is generally given to studies on the cost-effectiveness of those new energy sources. It is recommended that the existing disadvantages of renewable energies be set off against fossil and other traditional forms of energy in such a way that the external ecological costs are taken into account for traditional forms of energy. Possible promising instruments to this end include taxes on fossil fuels which are being discussed in many industrialised countries at the moment or other legislative measures such as, for example, the American PURPA or the German Act on the Remuneration of Private Electricity Producers Supplying the National Grid. Political instruments of this kind can considerably improve the economic efficiency of renewable energies.

This also applies of course to public promotion of research and development and corresponding promotional programmes for the large scale introduction of renewable energies into the market.

The problem I have in evaluating proposals of this kind is that I know that public funds are limited and I am also aware of the barriers against an increase in price of traditional energy forms. It is all well and good to give advice on increasing state subsidies for renewable energies or on increasing the price of fossil energies, but this does not solve the political problem of putting these into practice.

I do not wish to neglect the economic problems to be faced, but it seems to me that the social and societal implications hindering or promoting the success of renewable energies are even more important.

A major part of the technologies required to use renewable energy sources is geared towards decentralised use. It is therefore necessary to mobilise private capital in a wide-ranging and decentralised way, so that renewable energies are used on a wide-spread basis. Two obstacles stand in the way of this need for investment:

On the one hand society and economy in industrialised countries have grown used to the fact that, in particular in the electricity sector, the investment capital is provided by utilities which at the moment largely cover energy use in a centralised way. These investors largely see the growth of renewable energies in energy supply as a zero sum game; this means, that in view of the decentralised way most renewable energies are provided, these investors will have to cope with the reduction in demand for the kinds of energy they offer and with a price-lowering tendency of the energy supply.

On the other hand the industry sectors which are interested in an increased economical use of renewable energy technologies also in the main provide technologies for the large energy supply monopolies or oligopolies. In the demand situation as it exists today, they are therefore not all that interested in intensive marketing for renewable energy techniques.

In industrialised countries, anyone wanting to use renewable energies on a commercial or private basis must overcome not only economic obstacles but also in particular behavioural impediments. People have the choice between the comfort of electricity provision from the socket on the wall, heating provided by oil, gas or traditional electri-

city provision or have to deal with many individual problems and risks if they choose to use renewable energies. These begin at the very outset with the choice of an architect whose advice must be sought to draw up a plan for a house of this kind. It continues when trying to find workmen and engineers required to fit the appliances needed for the use of renewable energies and in harmonising the components of individual renewable energy technologies.

If we compare the economic discussions on the introduction of renewable energies with those on the propagation and introduction of new telecommunication techniques, I, for one, am compelled to think that the assessments of economic efficiency, worked out with such precision, completely miss the point.

I daresay that new computer and telecommunications techniques have not led to a reduction in the costs of compatible services either commercially or in domestic terms. Seen against the backdrop of the entire economy, however, these investments were seen as a tonic for growth. At the same time, the demand led to a reduction in unit costs of the individual technologies which in turn led to a rapid and drastic change in the economic efficiency of these technologies.

If we continue in this train of thought, the problem surrounding the introduction of renewable energies could be reduced to two factors. On the one hand there is the lack of interest on the part of private energy consumers in investing in decentralised, relatively independent energy provision and, on the other, the rather structural problems posed by a mainly centralised energy sector which sees in

any increase in decentralised energy supply first and foremost competition for its own economic activities.

Asked for the reasons why it is possible time and again to mobilise state funds and private investment capital for large-scale technical projects such as space research and other capital-intensive superprojects while in comparison state spending and private investments in renewable energies is relatively small, the answer, I believe, lies with the following.

Renewable energies have, till now, not succeeded in persuading a wide cross section of consumers, investors, scientists and politicians that they are a trustworthy and real alternative to traditional energy provision. Everyone is therefore in principle in favour of the use of renewable energies, but noone is ready to run the risk of exchanging the comfortable security of provision with traditional energy sources for the uncertain future of at least part-provision with renewable energies. When all is said and done, this leads to a situation where, in view of the competition for available capital resources, the decision is taken in favour of security of supply based on well-known sources of energy.

The problem of renewable energies in industrialised countries, however, lies in the fact that markets for the use of renewable energies will only come into being if renewable energies are, as equal partners in energy supply, included in the economic efficiency and use calculations of investors and consumers.

What is required to bring this about, is, in particular, a further intensification of lobby work. In order to achieve this the work done by pressure groups must become more professionalised in order to promote renewable energy. In particular, however, the relevant scientific corps must leave its ivory tower and look in greater detail at putting the results of their research into practice.

My call for the practical responsibility of the scientific community is based on my own frustrating experience in the Federal Republic of Germany which I hope you do not have to deal with. An example: a foundation stone was recently laid in Germany for a building designed to house an Institute for Solar Energy Research without the people working for the institute and those responsible at managerial level trying to have any influence on the energy provision of the institute. The scientists indeed saw to equipping their laboratories and setting up their experiment areas, but they did not seem to show any interest in ensuring that their own administrative office was planned taking forward-looking energy and ecological aspects into account. This example shows that there must still be great changes in the minds of those responsible in industrialised countries so that the breakthrough of renewable energies which we all agree is necessary may come about.

Scientists, potential investors in industry and potential users in the private sector are, however, quite rightly demanding that the necessary framework be set at a political level in order to allow renewable energies better opportunities to break into the market. Let me speak briefly about how, in the Federal Republic of Germany at least, those responsible at political level have taken up this challenge.

Changes in the political framework

In the CO<sub>2</sub> reduction programme passed by the Federal Government on 7 November 1990, great priority is given to promoting and tapping the potential of renewable energies. On 1 January 1991, the Act on the Remuneration of Private Electricity Producers came into force, improving considerably the economic efficiency of electricity production from renewable energy sources. A wide introduction on to the market of energy forms of this kind is also being promoted by means of programmes, such as the 250 MW programme for wind energy and the so-called "1000 roof programme" for photovoltaic.

Also on 7 November 1990, the Federal Government announced its intention to support an industrial cooperation project within the European Community in order to increase industrial capacities for renewable energies in Europe.

Furthermore, the introduction of a CO<sub>2</sub> levy and the whole range of other charges on fossil fuels are said to reduce the advantages in economic efficiency they have over renewable energies.

The Enquête Commission of the German Bundestag on preventative action to protect the earth atmosphere also believes it necessary to tap the potential of renewable energies in the short term.

Apart from using the instruments I have already mentioned, the Enquête Commission - and indeed the Federal Government - also believes it is necessary to improve education and training for the relevant professional groups, in particu-

lar for architects, engineers and skilled craftsmen in order to achieve the wide-spread use of renewable energies. The same also applies to intensifying information and advice, taking measures in the field of standardisation and quality control and using new forms of financing, for example by third-parties.

In a democratic, market economy society, the implementation of political objectives requires a wide consensus on the part of the relevant social groups. In principle, the same situation is reflected in political decision-making process as I mentioned when I was discussing the economic and social problems of implementing renewable energies. What the political sphere needs above all is support from strong lobby for renewable energy sources. I know that when I say this to you I am indeed "carrying coals to Newcastle". You rightly expect the political sector and those who prepare political decisions to make an independent contribution. I believe, that in spite of the problems I have mentioned, the opportunities for renewable energies have never been so favourable as they are today. The fortress of the traditional energy sector is showing considerable cracks. Renewable energies enjoy a tremendous amount of sympathy today. Problems arise in particular when demands and recipies for success concentrate only on the provision of state promotional funds.

It would be helpful if the political sphere were to show how the objectives of those who support renewable energies could be put into operation in more specific terms in the form of realistic individual steps. Furthermore, specific economic and social impedements should be dealt with which at the moment are standing in the way of a widespread use of renewable energies. I would very much like this roundtable to make a contribution to this here today.