

THE FUTURE OF NUCLEAR POWER

FERNANDO DE YBARRA CHAIRMAN OF UNESA

Just a few days ago the world celebrated the fiftieth anniversary of the beginning of the nuclear age.

As in the case of other important events that have changed the history of the world, everything began almost anecdotically, in an old squash court in the University of Chicago. There, on December 2nd 1942, a group of forty scientists led by the Nobel Prize winner Enrico Fermi obtained the first nuclear chain reaction. And in less than nine years from that date nuclear power was first used to generate electricity to supply Arco, a town in

the state of Idaho, in the United States.

The development of nuclear power throughout the world over the last fifty years has been truly amazing, both in respect of its scientific and technological base and its generating capacity.

Spain was able to take advantage of the initial development of nuclear power and immediately opted to train scientists and technical experts who could then implement an extensive nuclear electricity generation programme. Thanks to this programme, Spain is now one of the most advanced countries in the world in the field of nuclear power.

The development of nuclear power began during the Second World War and advanced during the long years of the

Cold War, managing to overcome two not too distant energy crises. In consequence, today there are now 420 nuclear reactors in operation throughout the world, with a total capacity of 326,611 MW. Twenty-five countries use nuclear power to generate electricity and twelve of these countries obtain more than 25% of their electricity supply from this source.

It must also be recognised, however, that the doubts regarding the safety of nuclear power stations that have arisen among wide sectors of public opinion have restricted the industry's development in a number of countries in recent years.

TOWARDS A LEVEL OF SUSTAINABLE DEVELOPMENT

Man has had to become aware of the threat represented by climatic changes, environmental pollution and world population growth, and of the needs and requirements of Third World, in order to recognise the fact that energy continues to be a highly important question.

At the Congress of the World Energy Council held in Montreal (Canada) in 1989, a commitment was assumed for establishment of a coordinated approach to the challenges posed by the energy question, the environment and economic development.

These are three matters that have now gone beyond national borders and have become transnational questions which must be approached globally. The close relationship between the three questions is evident, but establishment of a point of equilibrium between the three is more problematic. We know that economic development depends to a great extent on energy, that this development is indispensable in order to bring about an improvement in living standards in a large number of countries of the world, and that until adequate living standards are obtained, it will be very difficult to maintain economic, social and political stability on an international level.

During the three years that have elapsed between the World Energy Congress held in Montreal and that which was recently held in our country, not only have there been highly important changes such as those which have taken place in



Fernando de Ybarra

eastern and central Europe, but there has also been a sharp slowdown in the international economy and, at the same time, increased awareness of the threats currently faced by the environment. For this reason, the XVth Congress of the World Energy Council, which brought together several thousands of experts last December in Madrid, emphasized still further the urgent need to reach an equilibrium between the three abovementioned aspects, with a view to achieving the target of sustainable development. Among its conclusions, the Congress underlined the need to "sustain and develop the worldwide capacity for safe generation of nuclear power, and to make public opinion aware of this need".

ENERGY DIVERSIFICATION

In effect, as man has gradually discovered new energy sources, as is the case of nuclear power, new problems have also arisen to test his capacity to face up to the energy challenge. Nowadays a large number of these problems are concerned with conservation of the natural environment and, in particular, with the climatic changes resulting from the accumulation of gases, including carbon dioxide (CO₂) which is generated in combustion.

This means that increased generation of electricity using traditional fossil fuels must be considered in accordance with criteria based on efficiency, rationality and caution. And that greater impetus should be given to the development of clean combustion techniques that provide greater energy efficiency and to maintenance of the energy supply on the basis of balanced and diversified use of the different energy sources available. Nevertheless, stabilisation of the level of CO₂ emissions which has been achieved in recent years in the industrialised countries poses a much more difficult challenge in the developing countries, where combustion of their energy resources is the only solution open to them, particularly when it is borne in mind that these same countries are precisely those with the highest rates of population growth and, therefore, with the greatest energy requirements.

In effect the population explosion, which runs parallel to the struggle for economic development, will multiply the demand for energy in the coming years and may endanger achievement of this level of sustainable development that enables energy requirements to be met with no harm being caused to the natural environment.

The need for a solidarity programme with the developing countries, not only as a result of the inequalities existing in

respect of availability of energy resources, but also by virtue of the lack of modern technologies available to these countries, is a question that is of interest to us all. It would be a serious error, and one that would lead to a serious threat to the environment, if a lack of economic and technological aid were to mean that these countries developed their energy programmes using the same systems as those that were used in the industrialised world until quite recently. These countries must be provided with the most up-to-date technology, since the benefits that may be obtained from this aid will be to the advantage of all mankind.

The aid required by the countries of the CIS and of central and eastern Europe in order to undertake an appropriate energy transition, in which they must guarantee the safety of their nuclear power stations, within the framework of economies immersed in a complete transformation process, represents one clear example of the need for this spirit of solidarity.

All these reasons, and many others that may be added, point to the need to diversify energy sources, to apply new technologies to combustion processes in order to reduce emissions of pollutants and to increase public awareness of the fact that the contribution made by energy sources that do not require combustion, such as nuclear energy, is, where possible, increasingly necessary.

APPROPRIATE COMMUNICATION

By virtue of all the above, it is most important for there to be genuine communi-

cation with the public on the question of nuclear power; communication based on transparent relations between the nuclear industry, the operators, the control bodies and the users, in order to increase awareness of the fact nuclear power, which represents practically zero risk in the western world, today constitutes something more than just an economic option.

The processes of slowdown or stoppage of nuclear programmes that have been seen in a number of countries, such as Sweden and Italy, are now beginning to be disputed, whilst other countries with considerable nuclear power capacity, such as France and Japan, continue to forge ahead. And in general there is a well-grounded hope that the application of the new technologies for advanced passive safety reactors, due to be introduced by the end of the 1990s, and whose safety guarantee is based on the natural laws of physics, will enable the barriers of distrust that persist in certain sectors of public opinion be overcome.

We are, therefore, facing a period of increasing awareness of the present, and above all of the future, need for nuclear power. And we are also awaiting increased social acceptance of this source of energy, thanks to the application of more advanced and safer systems and to the development of genuinely transparent communication networks.

Nevertheless, for the purposes of all the above, the extensive experience that has been acquired by our nuclear technicians and experts over the years must not be allowed to be lost due to inactivity, and it is essential for the development of the Spanish nuclear power industry to be returned to them as soon as possible.

