Introduction

The euphoria of the 1950s appears to have given way, first, to timidly expressed fears, then to doubts, and ultimately to a defensive attitude with respect to the role which nuclear energy could play in meeting the world's energy needs.

As people began to become aware of the problems associated with the environment nuclear energy was at first considered to be "clean". Since that time it has been placed in the same category as other forms of energy and has been assailed together with them from all sides. However, nuclear energy is also subject to attack in contexts which are more specific to it alone and which relate to its nature (radioactive pollution), its fuel cycle (treatment of waste) and its non-peaceful uses (diversion of fissionable material).

The following four articles have been written by Agency experts of the Division of Nuclear Power and Reactors in order to contribute to the documentation on energy basic information which the Agency has gathered from the studies which it carries out, either by itself or in collaboration with other organizations.

In a world-wide energy context it would appear that, in the short term (1985), the share of electrical energy from nuclear sources will remain modest, but that the prospects of development after that time could have a significant effect on the prices of conventional fuels. Competition would therefore continue between nuclear energy and the other forms of energy currently produced. Towards the end of the period under consideration it will already be necessary to make a uranium prospecting effort if it is desired to maintain proven reserves at competitive prices and at a level capable of keeping pace with the output of nuclear energy envisaged for the last decade of this century. A rational investment policy will have to be carried out in order to triple the capacity for enriched uranium production between now and 1985. It does not appear, moreover, that any commercial leap forward can be expected in the field of breeder reactors before 1985.

In the long term, before the year 2000, the increase in the demand for energy will make necessary increased recourse to nuclear power in more and more diversified forms, such as industrial heat, for example. It may well be that the growing role played by breeder reactors and high-temperature reactors will help to facilitate the technical side of this diversification, while at the same time it will certainly ease the problems of supplying nuclear fuel.

This, of course, does not exclude the possibility that research in progress in other fields, such as the use of solar energy, geothermal energy and, in particular, nuclear fusion, may bring nearer a solution to the technological problems of introducing them on a commercial basis.

It cannot be argued that, towards the end of the century, conventional sources of energy will still not have their role to play, but it is first and foremost in relation to the energy of nuclear fission that the new sources of energy will have to prove their competitiveness, and the battle will be a hard one if it is assumed that nuclear (fission) energy has now reached its maturity[1].

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[1] "Nuclear Power Maturity" is the title which has been selected for the European nuclear conference to be held by the European Nuclear Society in Paris from 21 to 25 April 1975.