

NUCLEAR ENERGY AND THE CHALLENGE OF CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

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During the second half of the 20th century the development of human activities, linked to economic and social growth, has led to questioning of its effect on the overall equilibrium of the planet.

IN 1987 the United Nations Organization, concerned about increasing environmental deterioration and the rapid consumption of resources, commissioned the former Lady Prime Minister of Norway, Gro Harlem Bruntland, and a group of experts to establish a “global agenda for change”, which was known as *Our common future*. The expression “Sustainable Development” was coined in that report as “that which allows the needs of the present to be satisfied without compromising the capacity of future generations to satisfy theirs”.

Energy is the driving force of modern civilisations. Energy services are essential for economic well being and contribute to increasing social stability by improving the average quality of life. The energy sector occupies an important place in the world economy in terms of jobs, income and wealth.

The control of atmospheric emissions of greenhouse and other gases and harmful substances should be based on an improvement of efficiency in energy production, transmission, distribution and consumption, as well as on an increasing contribution by non-polluting sources, especially renewable sources and nuclear energy. All energy sources should be used

in a way that respects human life and the environment as a whole.

The characteristics of nuclear energy allow it to contribute significantly to addressing the present and future needs for sustainability.

Throughout 2007, the eight Spanish nuclear reactors have produced almost a fifth of the total electricity consumed in the country and have guaranteed a reliable and secure electricity supply for our system.

With their continuous operation 24 hours a day, 365 days a year, the nuclear power plants have been the energy source that has operated for the largest number of hours throughout 2007. At the same time they have reduced imports of energy raw materials to a value of close to 6,000 million Euros, contributing to the mitigation of the greenhouse effect since they do not emit polluting gases to the atmosphere: the Spanish nuclear power plants avoid the annual emission of 40 million tons of CO₂.

Added to the guarantee of supply, linked to respect for the environment and a reduction of the dependence on fossil fuels, is the fact that the price of nuclear electricity is stable and predictable, since the cost of uranium ore implies less than 5% of the total cost of the kilowatt-hour produced, as a result of which any

variation in its price would have a limited effect.

Consequently, the nuclear power plants are essential for the Spanish electricity system. On the one hand they ensure a highly necessary electricity supply, since the demand for electricity is growing at a rate of more than 3% per year, and on the other they reduce the consumption of fossil fuels – it should not be forgotten that Spain's energy dependence on overseas countries stands at 85%-, produce competitive electricity and do not pollute the atmosphere. This is a very important aspect if it is remembered that Spain's CO₂ emissions are 35% higher than the commitment acquired through the Kyoto Protocol. Without the nuclear power plants, this figure would stand at more than 60%.

The long-term maintenance of the nuclear power plants is the first option to obtain a secure, competitive and environmentally respectful electricity supply. Indeed, the additional quantity of electricity that would be generated over 20 years of operation additional to the 40 initially foreseen would amount to some 1,200,000 GWh. This figure is approximately equivalent to the amount of electricity consumed in Spain over five years, with a stable and predictable generating cost and avoiding a large quantity of emissions to the atmosphere.

But in addition to this, it will be necessary to construct more reactors in the near future, such that by the year 2030 the nuclear contribution to the electricity system might reach 30%, the average in

the European Union. This will entail the construction some 10,000 additional MW.

At international level, an increasing number of countries, aware of the importance of nuclear energy, have decided to construct more reactors, increase the power level of those already in place or maintain their operation in the long term. At present there are 439 reactors in operation in the world, producing 17% of the total electricity consumed, and 34 more are under construction.

The characteristics of nuclear energy as regards environmental, economic and social aspects make it necessary to consider this energy source as part of the solution allowing us to address climate change. The sustainability of the energy system, which provides for a standard of living compatible with a democratic society, will require the contribution of this energy source, based on know-how and technology.

The research and development programmes will allow existing challenges and uncertainties to be addressed and ensure its contribution to a better future.

Current and future use of nuclear energy will be based on its favourable characteristics and on the development and promotion of scientific, technological, business and institutional capacities, which will allow the contribution of nuclear energy to sustainable development to be maintained.