

NUCLEAR ENERGY USE AND ENVIRONMENTAL QUESTIONPAPER

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ABSTRACT

In Brazil, nuclear plants are competitive and are capable to produce energy in a safe way, thus contributing to the stabilization of the national electric system and to the expansion of installed capacity and as alternative source of energy and applications for peaceful purposes, preserving the environment and planet inhabitants. The world is coming across an energy requirement that will hardly covered by renewable sources presently researched. Though there is almost unanimity in the scientific community about the fact that nuclear energy is still a better option to replace oil and coal, environmental restrictions go on vigorous. And consequently, this non-consensus on nuclear energy benefits contributes negatively to greenhouse effect, weakening of ozone layer and global warming.

1. INTRODUCTION

Environmental question emerged in central countries along discussions and concerns which permeated, in XX century, the sixties *contra-cultural* movement and oil crisis at the beginning of seventies. Life and development styles of these countries started to be contested by what they represented – and still represent – in terms of environment degradation. It is pointed out the industrial growth, the inadequate use of new technologies and sumptuary consumption as causes that enabled the destruction of natural and social life spaces[5].

In Latin America, composed by countries economically dependent on power hegemonic centers, the picture is more serious, once the environmental degradation is associated to the social degradation. Within economies impoverished by external indebteding and by aggravation of inequalities between North and South, Latin-American States do not answer to socio-environmental requirements. Exportation agriculture, based on large estate, in monoculture, in *quimismo* and in mechanization, throws out men from the fields, accelerating the rhythm of demographic concentration. The poor distribution of migrant population and dirt and chaotic industrialization process feed the metropolitan phenomenon[6].

Public Power does not find resources for required investments on infra-structure and urban equipment. Public services system does not answer to society necessities. And consequently, the variety of chronic socio-environmental problems: air contamination, shortage of potable water, sewage thrown directly into water courses, sound pollution, garbage inadequate

destination, slumming, lack of a health preventive system, malnutrition and violence. At the end, the “misery pollution”[2].

2. ENVIRONMENTAL QUESTION

We can not lose the focus, nevertheless, that the environment question is a global question. Effects on environmental degradation do not respect borderlines. The imminence of atomic catastrophes, greenhouse effect, weakening of ozone layer, oceans poisoning, demographic explosion, natural resources running out, desertification of fertile areas, the lost of biodiversity, are problems which attain the whole planet. It is too a global question because it can not be understood and faced in separate. Environmental question is primarily, a socio-political question. A question connected to the developing model, life style and way of organizing power and property of a given society type.

Clube de Roma study, in its basic conclusions, set in a clear way the socio-political profile of the ecological question. This study, dated 1972, when denounced the risks of an endless growth for worldwide population, fought in favor of an effective population actions towards the reversion in the trend of accelerated and destructive growth and to attain a state of ecological and economical stability, of global balance, capable to satisfy, in a far future, basic materials requirements of each person in Earth and to guarantee to each one of them equal opportunities for accomplishing their human potential. From these conclusions we can verify that the ecological question proposes a change on progress paradigm (endless growth) via population political action, to make viable the life on the planet at social equity conditions[4].

A posteriori, eco-development theory, founded on social equity tripod – ecological prudence – economical efficiency, reinforced socio-political aspects on the environmental question. Principles and directives for this theory harnessed information on the production of international documents on environmental and development – from *Declaração de Cocoyok (Conferência das Nações Unidas sobre Comércio e Desenvolvimento)*, de 1974, to *Declaração do Rio de Janeiro (Conferencia das Nações Unidas on Environment and Development)*, 1992.

Due to the comprehensiveness of ecological question, the understanding about the meaning of environment can not be reduced to nature spaces and resources. It should be enlarged to contain, too, relations “between socio-cultural systems and its biophysics support, in a hierarchy of organization levels which initiates from local or communitarian up to global or eco-spherical.”

The role played by civil society agents has being been fundamental in the approaching and the facing of this question. In Occidental Europe, environmentalist movement grew and got stronger, actuating alongside other pre-existing movements, as those of minorities and pacifists, this later getting mixed up with fights against the use of atomic weapons. At first, it characterized itself as contestation and anti-institutional movement. It had an actuation toward protests against environment pollution (nuclear plants, rain acid, etc...) within a society context that reached good freedom and consumption levels, but whose politics conspired against life quality and humanity future. With a social base formed by more informed layers of a called “new medium class”, the movement showed, in a first moment,

scepticism in relation to institutional solutions and suspicious related to leaderships, completely ignoring future generations.

At this time appeared first international works on environmental degradation in the planet, with analyses that approached the interdependency of countries and the formulation of a new order towards the overcoming of a worldwide ecological crisis (*Conferencia de Estocolmo sobre o Meio Ambiente, Clube de Roma, 1972.*)

Winning the naive romanticism from the first existence years and with a poor understanding on the actions restrict to denouncement and protestation, European environmentalist movement started, as well, an institutional fight. Critical about State capitalist and socialist models, it found an alternative way for the participation: green parties, which started to settle in the political horizon from 1980 decade[3].

While shows a similar course, the environmentalist movement in Latin America has not already reached the same European participation and influence degree. By the end of sixties, appeared movements in Venezuela, Mexico and Brazil. By the beginning of eighties, in Argentina.

At a first moment it denounced the environmental degradations; more recently started to participate from the institutional and parties politics, however, in a non articulated way and without a determination of its own channel.

We have, thus, a picture of a global crisis, enhanced by unbalances in international relations, by the concentration of power at various levels, by the uncontrolled growth and harmful to the environment, leading to bankruptcy the society models shown up to now. More than a political or economical crisis, we could say that we live in climate of values crisis due to lost paradigms and to the absence of clear and utopian horizons to drive population action toward the definition of a society type to construct[6].

In the criticism on economical nonsense for models shown, either by the capitalism or by the real socialism, the environmentalism fostered a depth on the analysis of fundamental contradictions of our society. The first one permeated thoughts and actions of socialist from Marxist trend, which pointed the connection between work social orientation and production private appropriation as the reason for the unjust wealth distribution and the consequent social degradation. Besides, environmentalist movement pointed out a second one, that is, the contradiction between the development of productive forces and the environment deterioration, basis of chaotic economical growth process that leads to environmental degradation[5].

The actual crisis reveals a type of organized society in a way to reproduce and to deepen these contradictions. Actions and relations inherent to the structure cause the concentration of wealthy and misery, as well, the deterioration of environment, at last, the degradation of life quality in economical, social and ecological aspects. Social degradation and environmental degradation are mutually connected. Economical, social and ecological questions interpenetrate and in a given way are related to the overcoming of the actual society model, implying on the concomitant facing up of all of them. If we do not understand these questions in its mutual complementary, we will make innocuous the fight for changes. Environmental question appears itself as a required indicator in search of alternative ways, once it fosters

new opening for the revision of world conceptions, up to now hegemonic. It points out toward a new paradigm, alternative to society models known up to now. It rescues the realism-utopian as an indicator of politics action, as an ideal releaser to drive the strategies for the construction of democratic society, having as objectives:

- The overcoming of alienation from classes that presently are alongside political and economical process;
- The overcoming of other ways of social problems that occur in sectorial levels and in infra-classes (status, sex and age);
- New interaction man/nature, with an inversion in environment degradation processes.

In summary, strategies that are in search of the harmonization between economical development and social development at the target of sustainable development[2].

3. HYDROELECTRIC OR NUCLEAR ENERGY

It is large the environmental impact that a hydroelectric causes at a short, medium and long term; it is required to flood a great area where live hundred of *fauna* and *flora* species, besides the man himself, loosing many times immense extensions of cultivable soil. Required investments to compensate the impacts suffered by local population and by the environment are very high.

Besides, recent studies show that a great reservation of biomass deposited at the bottom of tanks deteriorates releasing gases as carbon dioxide and methane, which contribute for a raise in greenhouse effect. As the coal, oil and natural gas, nuclear energy is one of various ways of obtaining electricity in a large scale. Nevertheless, in next decades, fossil fuels have a trend to extinguish or to become excessively harmful to the environment[1].

In Brazil, due to the economical growth, the necessity of increasing electricity production has being too much put on pressure the planners. Every alternative (imported coal, imported gas, hydroelectricity and solar energy) have their technological, strategical and environmental problems which are being carefully analyzed in order to provide the best choice for the country.

Naturally, nuclear energy is being considered too.

Besides reducing the level of CO₂ emissions, nuclear energy shows economical advantages when compared to other energy sources, principally in front of unavoidable shortage of natural resources in the world. While oil reserves guarantee 50 to 60 years of consumption, natural gas has reserves for 160 years. And, in so far as these reserves are being consumed, their price raise proportionally. On the other hand, the uranium, nuclear energy raw-material, is provided with endless reserves, and, even its price suffers a raise, this evolution will cause a very low impact in the cost of nuclear production.

Nuclear energy is the third source the most used in the world and the second one (46%) in the called industrialized countries. The use of nuclear energy is not an isolated option from Brazil.

This type of energy has an increasing participation in the total of electricity generated in the planet (17% in 2002, when compared to 18% of energy of hydraulic origin).

An experience well succeeded connected to the use of nuclear energy as an alternative energy source, in Brazilian territory, is the *Central Nuclear Almirante Alvaro Alberto*, located in Rio de Janeiro State, which comprises three nuclear plants units – Angra 1 and 2, at operation and Angra 3, in construction, that in 2001, both have generated 14.5 millions of MWh of energy, corresponding to 4.3% of the national electricity production, having significantly contributed to reduce, in Southeast region, the effects of the crisis on the supply of energy occurred in the period. At the same period, electrical energy produced, due to its low environmental impact, avoided the additional releasing in the atmosphere of 7 – 14 millions of tons of CO₂[1].

4. ARTICULATED CONCLUSIONS

1. Environmental question in its actions, normally does not respect borderlines, attaining indistinctly the whole planet. It is a sociopolitical question. A question related to the development model, to the life style and to the way of power and property organization of a given society type.
2. Environmental politics for protection are related to a set of programs, services and actions which have as target the preservation of the ecological balance of the environment and the integrity of cultural assets. But commonly are distorted and privilege particular interests in prejudice of diffuse interests.
3. The use of nuclear energy as an alternative energy source is required to fight the global warming and to save the planet. In a near future, nuclear energy will be able to realize constructive improvements which will make their plants cheaper and comprehensively executable, in a compact way and with *optimum* cost/benefit for the generation of electric energy.
4. An implantation politics for the use of nuclear energy, with a safe development, should be discussed and formulated in a national in the sphere of national Legislative Power, due to production and dissemination of knowledge that are extremely fast, in our global world.
5. The use of nuclear energy, as an alternative energy source and into applications for pacific purposes, aiming to the preservation of environment and planet inhabitants, is an immediate concern, and so we should keep it updated to the Law and Regulation in this field, not just at national level, but in parallel and in affinity with the International Law.

ACKNOWLEDGMENTS

The authors are indebted to *Comissão da Pós-Graduação do Instituto de Pesquisas Energéticas e Nucleares (IPEN/CNEN-SP)* for the releasing of the required funds to support their participation in the present congress.

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