NUCLEAR DEVELOPMENT AND THE CHANGING GEOPOLITICS

Editorial

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In February 24, 2022, the war in the Eastern Europe has started. The conflict is a huge one by the territory, resources and consequences. Beyond of the tragedy of more than 5 million of refugees, destroyed infrastructures and towns, there are clear concerns on the impact on the global economy. Some crisis may appear due to the deep influences in the circulation of goods, from the energy resources to the ores, metals or foods.

A real concern was raised since the nuclear power plants have been transformed into military targets. Without doubts, any NPP is a strategic infrastructure since it offers large amount of vital electricity for the daily functioning of the society, but also for the military strategic works.

Due to the magnitude of the plant and centralization of electricity production, an NPP is a vulnerable point in a military conflict. More interesting is the case of Chernobyl site, where no electricity is nowadays producing. What is the military interest for the site of the largest severe accident in the history of nuclear?

Is it the case of a real fear related to the possible use of dirty bombs? Or is it the case of terrorizing the opponents by a possible impact on the civilians with an ecological disaster? Or only the power of symbol to use the nuclear power plants in relation with the amazing power of nuclear bombs?

Any belligerent party will have a different perspective. What we are seeing today, the situation is clearly very far from the wonderful idea of ″Atoms for Peace″. The global society is confronting today with the possibility the war may use irrational means to gain the victory. The risk of a catastrophic event at nuclear sites is appreciated as low by the nuclear experts, but the disaster is still possible, especially if the fight will not bypass the nuclear sites.

Beyond of this, the war has transformed dramatically the view on the energy sector. Before the conflict, Europe was prepared to go straightforward the climate neutrality, the ambitious objective for 2050. A large penetration of wind farms and photovoltaic power stations in the electricity sector was expected, together with the closing of fossil fuel-based plants. A great role was targeted for the gas, at least in the transition period. The peak loads are planned to be covered by very flexible gas-fired plants. Some countries already implemented such strategies and now are in a difficult situation due to the war.

The natural gas becomes today a hot-issue in Europe since the most of the countries are very dependent on the import. There are some unexploited reserves, especially in the seas, but also in the form of shale gas. The last one suffered great debates and until now there is no acceptance for the technology of hydraulic fracking in Europe.

In such context, the security of supply and independence become the most critical issues. European countries cannot rely on import of gas from the East. Thus, for the coal and nuclear a new context appeared. It is more and more clear the energy transition cannot have the planned speed for decarbonization. Many coal plants will not be phased out on short term. On the other hand, the nuclear sector has a real opportunity. *Is it prepared for this? Some delayed projects, such as Cernavoda U3 and U4, may be revitalized. But beyond of these, what is to do?*

Due to the long duration to build a new nuclear plant it is the time to introduce small modular systems having reduced construction time and benefiting from a modular building. Unfortunately, many projects of SMRs are in the stage of conceptual design. Few of them are better positioned in terms of licensing and preparation for the implementation.

Paradoxically such situation may be an advantage. The reducing of the number of options may boost the deployment of the remained ones, offering a significant opportunity for a suitable replication. In such manner the effect of standardization, factory fabrication, and learning will create and demonstrate economic advantages.

For the public opinion, it is now easier to understand the crucial importance of nuclear power, at least as a backup solution for a country without large hydro reserves and having a well-defined strategy to implement the climate actions. *Nuclear may shift the country from the import dependence to almost independence.* Of course, the import of nuclear fuel or uranium ore remains an issue, but it is not as critical as the dependence on a gas pipe crossing countries in the war.

Clearly this spring was a time of reflection for many decision makers in the energy and also for the politicians.

On the other hand, *the crisis of the energy sector*, reflected by the significant increase of the energy prices on the European markets, *shows the importance of the stability of the energy production*. The war and the energy crisis have overlapped producing concerns both for the society and business world.

What is the direction of the development? Has the globalization enough resources to adapt to a new context? Or is it the time to change the paradigm?

Without any doubt, our societies and lives are highly dependent on energy abundance. Everything related on, our households, our foods, our transport, our education, our work are crucially influenced by the energy availability.

In this context, our journal is oriented to publish meaningful results oriented to reflect the efforts of the research and development, education and training, academia and industry, and also the efforts to build sustainable decisions by involving the diversity of the stakeholders.

Probably, *the wise step to follow immediately is to reduce the wasting of energy in any form*, by direct consumption of energy and by indirect possibilities such as the wasting of foods and resources.

Secondly, the energy efficiency should be largely implemented in all sectors from the production of energy to the production of goods, and household consumption.

A reduction of the consumerism will may have beneficial impacts on the future sustainability of our societies. Beyond the horrors and the negative impact on the environment, society and planet, the war obliges us to think, to reflect on our human conditions in the local and global environment, and to understand our limitations and needs of more wisdom to keep the balance for a future. Without deep thinking we cannot survive.

It is the time to think for our planet, not for the future of our small interests and groups! It is the time to have enough rationality and judge the nuclear in terms of benefits and informed risks. This is to understand the way to go further.

Dear readers and dear potential contributors, you are welcomed in our journal to participate to a balanced debate on the nuclear issues and moreover to contribute with innovative and valuable solutions to the nuclear development in the context of the modern society sustainable development.