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The Strategic Dimensions of the Fusion Energy Challenge

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Human beings have a short history in universe terms. Just 200.000 years old and no more than 100.000 years old out of Africa. As a consequence of climate changes those men decided to leave the continent looking for new land and new opportunities to prosper. It is impossible to understand the history of the humankind without keeping in mind its effort to understand the reality and to overcome the challenge to transform it. No other species has been able to advance so much in the knowledge of the environment; but those advances resulted, at the end, in radical changes in the environment, in our cultures and in our identity.
Our civilization is built on the idea of permanent economic progress. We need to generate wealth as a premise to guarantee welfare, education, health, research, social cohesion···The economic activity requires energy. Our history shows a constant effort to improve our ability to generate more and more energy at minor possible cost. Economic revolutions are at the origin of social and political revolutions, but in many cases they are themselves a consequence of previous energy revolutions.
If the capacity to generate energy is the precondition of economic progress and social welfare, we have to conclude that energy independence is a key goal for all the states. In advanced societies we have to face with growing demands of secure and clean energy sources at the same time. As a consequence nuclear fission, one of the cheapest an easiest ways to generate energy in large quantities, has been called into question. Without fission energy a large number of countries would have to largely depend on others to access to the necessary energy resources. Every day we see how energy dependence implies political dependence. A sovereign but energy dependent country has to condition its policy to the supplier's interests.
A free access to an unlimited and cheaper energy is the basis of political independence and equal opportunities in the global market. Research and production costs are conditioned by the price of energy. Political leaders try to confront these challenges through a diversification strategy. They are eventually succeeding in reducing the strategic limitations, but not the high costs of the energy generation and its effects. In some cases, like fracking (hydraulic fracturing), environmental impact remains a serious problem. In others, alternative ways of generating energy like Solar or Eolic power plants involve in many occasions a serious impact on the landscape and the environment.
If we want a clean and cheap energy that guarantees not only respect for nature but also independence of states and enterprises, we need to direct our attention to fusion power. Nowadays fusion power is a major scientific challenge that requires the effort of everyone. A join action is required to overcome the challenges posed by its generation and this implies the involvement of states, the support of society and the determination of the scientific community. Success is just a matter of time and resources, and the consequences promise to be extraordinary.

As a carbon-free energy source based on abundant fuels with no particular geographic distribution, controlled thermonuclear Fusion would eventually represent a breakthrough in the history of the mankind. Deuterium can be extracted from water and tritium is produced from lithium, which is found in the earth's crust. Significant progress is being done in making Fusion energy production a reality. ITER will be the biggest Fusion reactor on earth, but science and technology gaps still remain and need to be closed. Researchers and engineers together with policy makers require all needed tools to accomplish this new revolution in the history of the mankind, bringing the energy of the Sun and all other stars to the Earth to be used for peaceful purposes. Fusion power will give way to a new era where access to a clean, safe and unlimited energy will be a reality, an era with new challenges, such as the conquest of space. We will leave behind many of the problems that characterized 19th and 20th centuries. At last we will have at our disposal the power source required to navigate beyond our solar system.

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