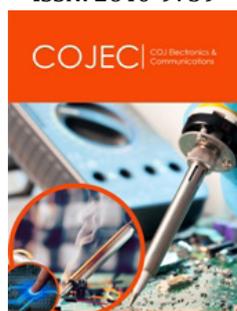


The Need for a Sustainable Energy Transition in Spain

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Opinion

Sustainable development and climate change have gone from being issues to be dealt with superficially at various international summits to become real problems on which concrete decisions need to be taken in a short period of time. To give a few figures on the seriousness of the problem, in the last 50 years, atmospheric CO₂ concentration has increased by more than 30%. More than 10% of Green House Gas (GHG) emissions are due to deforestation. These emissions are similar to those generated by land transport, mainly cars and trucks, which continue to have a high dependence on traditional fossil fuels. The United Nations Climate Change conference held in Paris in 2015 set a goal of limiting temperature rise this century to below 1.5 degrees Celsius, yet 17 of the 18 warmest years in history have occurred since 2000.

When talking about sustainable development, three fundamental factors are been related: (i) ecology; (ii) economy; and (iii) society. A balance between these factors is necessary for the system to meet the needs of today's society as well as the needs of future generations. However, there is a directly proportional relationship between society's quality of life and the consumption of energy resources. For this reason, developed countries with higher standards of living consume more energy resources.

Another example of this direct relationship between quality of life and consumption can be found in the lockdown carried out in Spain after the declaration of the state of emergency on 14 March 2020. The paralysis of economic and social activity as a result of the confinement led to a substantial reduction in consumption and economic activity, with a drop in Gross Domestic Product (GDP) of close to 10% in 2020. But this example also shows the inversely proportional relationship with the third factor of sustainable development, ecology. The paralysis of economic and social activity led to a drastic reduction in CO₂ emissions in Spain, to levels similar to those of 1990.

Faced with this situation, Spain has opted for the development of the National Integrated Energy and Climate Plan (NIECP) for the year 2030, which establishes a series of objectives in terms of the power of the different electricity generation technologies installed. By 2030, Spain will have an energy mix fundamentally based on renewable generation sources, which will be capable of meeting the objective set by the European Horizon 2020 Strategy and supplying more than 20% of the electricity consumed in the country. It is necessary to affirm that Spain is already capable of generating more than 20% of the electricity it consumes from renewable generation sources.

With more than 50000MW installed in 2030, wind energy will be the most installed electricity generation technology in Spain. It will be followed by other generation sources

such as solar photovoltaic - with more than 39000MW installed - and combined cycle plants, with more than 26000MW of installed capacity. In this scenario, hydroelectric power will maintain its installed capacity at levels similar to those it had in the early years of the 21st century - around 14000MW of installed capacity - and other generation sources such as thermal power and nuclear power will have practically disappeared. In the case of thermal power, the vast majority of coal-fired thermal power plants were shut down in 2020. Meanwhile, in the case of nuclear energy, the planned closure schedule foresees a reduction of 50% of the currently installed power by 2030 - over 7000MW - and a total shutdown of nuclear power plants in Spain by 2038.

However, the instability of energy supply in Spain and other industrialized countries has reopened the debate on the sustainability of the system. The rise in electricity prices in a marginality market, derived from this scarcity of energy resources, has meant that many families and/or companies cannot afford this increase in their electricity bills. The dependence on fossil fuels, which in Spain exceeds 70%, has led to a staggered increase in the price of electricity, which has reached over 300€/MWh. Faced

with this situation, it has been necessary to take a series of political decisions aimed at helping the neediest families and also at securing the energy supply. The need to establish a secure and stable supply of natural gas has generated the objective of establishing new international alliances to generate new supply routes. Recently, the debate on the need for thermal energy, rejected months ago as a source of electricity generation, has been reopened. Also, the debate on the long-term need for nuclear energy, a technology that does not emit CO₂, has resurfaced in the face of the instability of other sources of electricity generation, which require unstable natural resources such as the wind or the sun.

There are months of intense political and social debate ahead on the stability of the energy system in Spain. This debate should be based on scientific and technical knowledge, being aware of the need to reduce the consequences of climate change, but also of the need to have a diversified electricity generation mix, where the different sources of electricity generation have a place, allowing us to reduce electricity prices and dependence on external energy resources.