Tomorrow's Affairs
Analysis of today
Assessment of tomorrow

By: The Editorial Board

A warning from the Pyrenees—Europe between renewable energy sources and nuclear reactors

The consequences of the power outage on 28 April, which affected 60% of the Spanish and Portuguese electricity grids, are dramatic. The devastating effects of the blackout present Europe with the difficult task of reconciling its aspirations for energy independence through the expansion of sustainable sources while managing the risk of supply instability.

The direct losses to energy companies and industry in Spain and Portugal alone are estimated at 5.3 billion euros, while the indirect losses, which include production losses and losses in tourism, transport and the service sector, further increase this figure to 7.6 billion euros.

Direct losses included interruptions to electricity production due to low capacities in thermal power plants and expensive repairs to infrastructure damage that occurred during the incident.

The losses in industrial sectors such as the automotive and chemical industries, which rely on a stable and continuous energy supply, were significant.

Spain and Portugal also suffered heavy losses in tourism, as many destinations had to suspend their operations for the duration of the power outage. This period of supply disruption led to losses totalling 2.1 billion euros in the tourism industry alone in Spain and Portugal.

Transport was also severely affected as rail systems and airlines suffered losses of 1.5 billion euros due to flight and train cancellations and delays.

The Portuguese railway system, which was highly dependent on a stable power supply, recorded losses of 800 million euros, while the Spanish railway lost over 700 million euros due to the complete paralysis of the network.

In addition, the indirect losses caused by slow economic growth, inflationary increases, and the rising cost of living in both countries are estimated at 2.3 billion euros. Although the direct losses are already a severe blow to the economy, the indirect costs, which include losses in retail, services and economic activity across the country, have even greater long-term consequences.

In search of energy independence

Before the Russian aggression against Ukraine, the EU was heavily dependent on Russian energy resources. Russia supplied the EU with almost 40% of its natural gas and was therefore a key factor in the Union's energy stability.

This dependency put the EU in a very vulnerable position, as dependence on a single supplier proved to be a strategic mistake in the face of political tensions.

When Russia and the EU entered into an energy conflict, the decline in gas supplies quickly showed how potential instability in energy supply could seriously threaten the economic stability of the Union.

According to Eurostat, the EU imported well over 150 billion cubic metres of natural gas from Russia in 2022, accounting for 40% of total gas imports, with Germany being one of the main importers.

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The decline in Russian supplies immediately shook the balance of the energy market, leading to a sharp rise in energy prices, increased dependence on LNG and a change in international political trends.

The EU was faced with the task of freeing itself from this energy dependency while at the same time finding alternative energy sources and accelerating the transition to renewable energy.

However, the global demand for LNG and the supply bottlenecks caused by political factors made this process challenging and costly with severe economic consequences for countries like Portugal, which did not have enough flexibility to withstand the pressure of the energy crisis.

Exit in green energy and nuclear power plants

These losses emphasise the need for change in the EU's energy sector, as the current system cannot guarantee an uninterrupted supply. The question arises: how will the EU achieve energy independence while maintaining its focus on sustainability? In this context, the planned investments in green energy and nuclear energy are of crucial importance.

The investment forecasts for renewable energy sources and nuclear energy in the EU up to 2030 are estimated at 450 billion euros.

This includes investment in energy storage infrastructure, the interconnection of energy networks between member states and the development of new nuclear energy capacities.

France has already announced that it will invest 20 billion euros in the development of new nuclear reactors by 2030, while Germany, which had previously decided to phase out nuclear energy, is now considering investing 10 billion euros in the expansion of nuclear power capacity in response to the energy supply instability.

Poland and Hungary, which oppose a rapid transition to green energy, are now planning investments in the modernisation of thermal power plants and nuclear projects worth more than 25 billion euros by 2035.

Although renewable energy sources are considered crucial to decarbonising energy systems, their instability presents a major challenge

These investments would allow these countries to expand their use of fossil fuels with greater efficiency and lower emissions while reducing their dependence on LNG and other imported energy sources.

Although renewable energy sources are considered crucial to decarbonising energy systems, their instability presents a major challenge for countries striving for energy independence and stability.

Solar and wind turbines only generate energy when weather conditions are favourable (when the sun is shining or the wind is blowing). This fundamental problem of fluctuating generation means that while renewables are important, they cannot fully meet constant energy demand.

Weaknesses of solar and wind farms

Spain and Portugal face the problem of reduced production when extreme weather conditions, like long periods of cloud cover or no wind, occur, even though they are leading the way in implementing solar and wind farms.

As a result, they have had to rely on thermal power plants and gas-fired power stations to fill gaps in supply, which drives up costs.

Portugal, which has invested heavily in renewable energy in recent years, is now facing grid stability issues, including unbalanced production and an increasing dependence on foreign energy suppliers.

According to experts from the European Energy Security Agency, one of the factors that contributed to the power outage in Spain and Portugal was insufficient energy storage.

Although renewable energy sources have made it possible to reduce emissions, the lack of adequate storage infrastructure led to the grids overloading at times when energy demand peaked and renewable generation was insufficient to meet demand.

Nuclear energy, once considered controversial, is now emerging as a key solution to the EU's energy challenges. Innovations in Small Modular Reactors (SMRs) are enabling safer and cheaper energy production.

These reactors not only reduce the risk of accidents but are also much more efficient than older models, resulting in lower CO emissions. SMRs have much smaller dimensions and the necessary infrastructure, making them easier to integrate into the EU's energy mix.

Countries such as France and Finland already cover a large part of their energy needs with nuclear power, while Poland is planning to build its first nuclear power capacities in the coming years.

These technologies will allow the EU to diversify its energy sources, reduce the risk of unstable supply and ensure a stable energy source.

Political obstacles

Although nuclear energy is becoming increasingly significant in the EU, political differences continue to be a major obstacle. Countries previously opposed to nuclear energy, such as Germany, Austria and Belgium, are now faced with the inevitable need to increase their stable power generation capacities to ensure energy-independent grids.

In Germany, which has begun its energy transition plan towards renewables, the reality of reduced energy supply has created political pressure to reconsider the nuclear phase-out.

The EU faces the task of harmonising energy policy objectives with political reality and ensuring that its energy policy responds to current challenges - Blackout in Spain

Belgium and Austria are also facing major economic problems due to rising energy prices and increasing dependence on foreign energy sources.

If the EU relies solely on renewables without a stable nuclear component, the energy crisis could worsen in the coming decades.

For the EU, the future of energy policy will not only be a question of technological progress but also of political compromises between member states.

The planned investments in green and nuclear energy for the next 10 years will amount to more than 450 billion euros. This is the amount the EU needs to achieve energy independence status and fulfil its carbon neutrality targets.

These investments will not only solve the problem of energy supply stability, but they will also enable the EU to become a world leader in energy transition and decarbonisation.

However, to ensure the continuity of energy supply, the EU must ensure that nuclear power capacity becomes a key component of the energy balance. This requires a political consensus, which is currently challenged by political differences among members.

The EU also needs to invest additional resources in connecting energy grids and

developing new energy storage technologies to create a stable and competitive energy system in which renewable and nuclear energies harmonise and do not conflict.

In the coming years, the EU faces the task of harmonising energy policy objectives with political reality and ensuring that its energy policy responds to current challenges but also lays the foundations for a secure and sustainable energy future.

If successful, the Union can expect a more secure, competitive, and environmentally friendly energy sector, which will set a new standard for global energy policy.