

THE FUNCTIONING OF THE ELECTRICITY SYSTEM

5

CARBON NEUTRALITY IN 2050: WHAT CHALLENGES FOR EUROPE'S ELECTRICITY SYSTEM?

During the last EU mandate, the key role played by the European electricity system in the decarbonisation was highlighted with the adoption of the European Green Deal in 2020, setting ambitious goals aimed at reducing by 55% EU greenhouse gas emissions by 2030 (compared with 1990) and achieving carbon neutrality¹ by 2050.

Reaching these goals requires a rapid and massive reduction of fossil energies consumption. This means strengthening the importance of **sobriety and energy efficiency actions on a European level**, so that energy is consumed in lesser proportions and in a better way, and that efforts to decarbonise energy consumption continue.

¹ Carbon neutrality means reaching a balance between carbon emissions and carbon absorption in the atmosphere by carbon sinks.

² In 2050, electricity could account for 60% of the final energy consumption of the European Union, compared with 23% today (source: Eurelectric).

The European electricity system also plays an essential role in the following ways:



Ramping up the electrification of energy uses to replace the consumption of fossil fuels². In practical terms, this entails the roll-out of a range of technologies, mainly in the transport sector (electric cars and heavy-duty vehicles and their charging stations, micromobility solutions, etc.), in buildings (heat pumps, thermodynamic water heaters, thermostats, etc.) and in the industry (electric furnaces, high-temperature heat pumps, electric boilers, etc.). Very much like what is happening with water heaters today, being able to control such technologies is a key factor to optimise the electricity system.



The rise of electricity generation, which should progressively replace fossil energies within the European energy mix and generate enough electricity to meet the needs for electrification. One of the major issues facing this development will be to **generate this electricity exclusively from low-carbon energy sources by 2050**, from nuclear and renewable sources, which leads to **significantly stepping up the development of new flexibilities** in order to balance the electricity system.



These two major transformations will also have a significant impact on how well the electric system operates, particularly in terms of the **development, modernisation and digitalisation of electricity grids**. This development of the networks will enable the electrification of uses and guarantee the connection and integration of newly built renewable facilities.

