

Southern Europe Solar Grid-connected System





Overview

What is the future of solar energy in Europe?

Solar PV and wind energy become the cornerstone of the transformed energy system, with solar PV being crucial for achieving self-sufficiency. By 2050, 5.1 TW of solar and 1.3 TW of onshore and offshore wind capacity will be installed across Europe (see Supplementary Fig. 13), taking up 57% and 36% of the electricity generation, respectively.

How do we model the European sector-coupled Networked Energy System?

We model the European sector-coupled networked energy system from 2025 to 2050 with 5-year steps, under a carbon budget corresponding to 1.7 °C temperature increase and imposing carbon neutrality by 2050, with a network comprising 37 nodes, using 370 regions to represent wind and solar resources, and a time-resolution of 2-h for a full year.

How much land does solar take up in Europe?

By 2050, 5.1 TW of solar and 1.3 TW of onshore and offshore wind capacity will be installed across Europe (see Supplementary Fig. 13), taking up 57% and 36% of the electricity generation, respectively. This requires approximately 2.3% of available land for solar PV and 3.7% for wind, equivalent to about 4.5% of Europe's total land area.

How can technology support grids for speed?

At the same time, cyber-attacks and extreme weather events are becoming more frequent. According to Eurelectric's report Technologies Supporting Grids for Speed, existing technologies can help manage this complexity, optimise the grid, enable renewable integration and reduce overall investment costs.



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Southern Europe Grid-connected Inverter

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