

## SolarTech Power Solutions

# Eastern European High Temperature Solar System



## Overview

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How has a heatwave impacted European power systems?

A June–July heatwave has caused stress for European power systems, driving electricity demand and doubling daily power prices. Yet grids remained stable, fueled by record volumes of solar. Heatwaves are becoming more frequent in Europe, putting electricity grids under severe stress.

When did extreme high temperature events occur in Eurasia?

From 1979–2023, extreme high temperature events rose in Eurasia during summer. Two heatwave patterns of spatial consistency and quadrupole anomaly are identified. A double jet structure during negative NAO phases drives regional temperature variations.

Why are Europe's electricity grids so stable?

Yet grids remained stable, fueled by record volumes of solar. Heatwaves are becoming more frequent in Europe, putting electricity grids under severe stress. Complementing the vast volumes of solar, solutions like clean flexibility and interconnection can help maintain grid stability.

What was the climate like in Eastern Europe in summer 2024?

ERA5-Land SM anomalies reveal that Eastern Europe entered summer 2024 with a record-breaking soil-moisture deficit, especially over Romania and Ukraine (Fig. S2e). SM values during summer 2024 were below  $-1.5\sigma$  relative to the 1981–2010 climatology (Fig. S2f). Fig. 1: State of the climate in summer 2024.

How does the warming trend in North Atlantic SSTs affect teleconnection across Eurasia?

Zhang et al. (2023) further identified that the warming trend in North Atlantic SSTs provides a distinct signal, reinforcing the wave train teleconnection across Eurasia. Strong convective activity over the warm SST regions of the

North Atlantic intensifies atmospheric circulation and enhances subsidence over continental Eurasia.

What are extreme high temperature events (EHES)?

1. Introduction Extreme high temperature events (EHES), one of the most destructive summer phenomena, have been extensively studied in meteorology due to their substantial impacts on human health and the natural environment (Alizadeh and Ghafarian, 2023, Alizadeh et al., 2024, Ahmadi and Alizadeh, 2023).

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