

## **Large-scale impacts of dust storms on the national photovoltaic capacity**

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### **Summary:**

Dust storms present growing challenges to the stability and reliability of photovoltaic (PV) energy production. This presentation explores the macro-scale impact of these events on national PV capacity, focusing on a severe dust storm that occurred in March 2022 in Spain. By integrating satellite observations, reanalysis datasets, ground-level irradiance measurements, and national power performance data, the study highlights the magnitude of the losses caused by high aerosol concentrations and adverse weather conditions. Results indicate a 50% reduction in the national energy yield over two weeks, with losses peaking at 80% on the most affected day. These results highlight the significant repercussions that such events can have on grids with high PV penetration.