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Impact of different module configurations on European storage needs

Photovoltaic (PV) power production is strongly influenced by the specific module configuration. Different PV configurations can have different potential for power production under different sky conditions. There are multiple factors like geographic location, solar elevation angle, cloud conditions etc that can substantially influence the productivity from different module configurations. The degree of fluctuations of PV power can also be quite different for one configuration to another. Since fluctuating nature of major renewables like wind and PV makes their grid integration very challenging, it is important to understand how power production and fluctuations occur for different module configurations under different meteorological conditions.

This motivates the current study which is performed under the frame-work of RESTORE-2050, a project aiming to understand the European power system with high penetration of renewables during 2050. Long term time series of different renewable sources have been developed and the mismatch between demand and generated power is analysed for all the countries in the model domain. To overcome the power mismatch, either backup energy is supplied from conventional (fossil fuel) sources or a storage with a particular capacity and efficiency is used. Understanding the impact of different PV module configurations on storage needs for European countries will be the main focus of the talk.

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