

FSR Climate Annual Conference 2022 – 8th edition

Friday 2 December

14:00-16:15 | Session – Energy transition

Presenter: Pedro LINARES (Comillas Pontifical University)

Title: *How much storage do we need for the energy transition?*

Abstract:

Future electricity systems will be mostly based on variable renewable technologies, such as solar photovoltaics and wind energy. Their variability will need to be managed either with flexibility in demand, with overinvestment in renewables, or with storage technologies that will help non-flexible demand meet the variable supply. In this paper we estimate the amount of storage that typical power systems may require, not only looking at the final decarbonized (2050) situation, but also in the transition (2030). In contrast to previous exercises, our work looks, with hourly detail, at worst-case cases, since these will be those that determine the amount of storage needed, as well as to the gaps that these situations introduce in the remuneration of storage in typical years. Our conclusions show the important role that regulating hydro may play, if the economic signals are right; the impact of demand flexibility (including hydrogen production); and the need to develop reliability markets that pay for the storage needed.

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