SEMINAR

“Solving Capacity Expansion Problems in Renewable and Storage Units Under Uncertainty”

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In this seminar, several models addressing the capacity expansion problem in power systems will be presented. To set the context of these problems, a brief introduction describing the particularities of power systems operation will be firstly provided, as well as the challenges that power systems are currently facing to reduce their greenhouse gas emissions. Then, three different capacity expansion models will be explained. The first model consists on determining the generating and storage capacity to be built considering long- and short-term uncertainties and a limit on the fossil-fuel production. The second model is based on the previous one, but the objective is to analyse the impact of the demand response on the capacity expansion decisions. The third model seeks to obtain better expansion strategies by using the properties of stochastic dominance constraints. Different case studies based on the European power system towards 2050 have been solved and so, multiple numerical results will be shown.