PROPER PLANNING PREVENTS POOR PERFORMANCE ON POWER SYSTEMS TOO: ON THE GOVERNANCE OF THE FRENCH ENERGY TRANSITION

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Abstract

Since the early studies paving the way for long-term power system planning (Bessiere, 1970; Grubb, 1991), through more refined studies using more comprehensive methodologies (Bouffard and Galiana, 2008; Green and Vasilakos, 2011), until recent developments combining cutting-edge simulation tools and up-to-date data (Brouwer et al., 2016; Després et al., 2017; Eriksen et al., 2017; Lorenz, 2017), power system planning has been a fervent research field, whose accuracy has become quite redoubtable along the time. However, it is still an ongoing field which is continuously fed by policy and institutional trends.

In today's liberalized electricity markets, proper planning means proper policies and regulation. Nevertheless, current energy policies seem poorly designed and indecorously implemented. This paper presents a techno-economic analysis assessing the decarbonization goals of the French power system by 2050. Namely, 96% of CO2 offset compared to 1990's levels and very high of renewable energy shares. It uses the DIFLEXO model to evaluate the required set of policies to achieve such objectives in a cost-effective way. The outcomes show that even with the promising technical progress and significant cost decrease of renewables and smart grid technologies, a stringent CO2 policy together with a Renewable Portfolio Standard would be required to attain such ambitious objectives. The additional cost of implementing such instruments ranges between 3% and 25%, depending on the scenario. The trade-offs dealing with decarbonization and cost overruns due to increasing integration costs of renewables are highlighted.

Keywords

Energy policy, energy transition, CO2 regulation, renewable integration, storage, demand-response

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