A Multi-objective Model for Transmission Planning Under Uncertainties - DTU Orbit

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The significant growth of distributed energy resources (DERs) associated with smart grid technologies has prompted excessive uncertainties in the transmission system. The most representative is the novel notation of commercial aggregator who has lighted a bright way for DERs to participate power trading and regulating in transmission level. In this paper, the aggregator caused uncertainty is analyzed first considering DERs' correlation. During the transmission planning, a scenario-based multi-objective transmission planning (MOTP) framework is proposed to simultaneously optimize two objectives, i.e. the cost of power purchase and network expansion, and the revenue of power delivery. A two-phase multi-objective PSO (MOPSO) algorithm is employed to be the solver. The feasibility of the proposed multi-objective planning approach has been verified by the 77-bus system linked with 38-bus distribution network junctions.

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