

INCORPORATION OF RISK METRICS IN ELECTRIC SYSTEM EXPANSION PLANNING AND PORTFOLIO EFFICIENCY ANALYSIS

vendredi 1 août 2025 15:00 (30 minutes)

This work presents a methodology for incorporating risk measures into the energy system expansion planning process. The approach involves a decomposed investment and operation model, where the objective function is modified to progressively place greater emphasis on minimizing the risk metric. By doing so, it is possible to calculate risk levels for different optimal expansion plans. The concept of the efficient frontier, borrowed from Modern Portfolio Theory (Markowitz), is applied to evaluate trade-offs between total costs and associated risks across various expansion plans. It provides a more robust framework for decision-making in long-term planning, balancing cost-effectiveness with risk mitigation strategies. The derivation of different optimal plans, each associated with a calculated risk, enables the construction of the efficient frontier curve, which offers a visual representation of the trade-offs between cost and risk for various expansion portfolios.

Authors: M. SOARES, Alessandro (PSR); GUERREIRO, Lucas (PSR); ANDRADE, Tiago (PSR)

Orateur: GUERREIRO, Lucas (PSR)

Classification de Session: Application in energy, finance or logistics

Classification de thématique: Applications in energy, finance or logistics