

State-of-the-art of Transmission Expansion Planning: a survey from restructuring to renewable and distributed electricity markets

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Abstract-

Transmission Expansion Planning (TEP) problem aims at identifying when and where new equipment as transmission lines, cables and transformers should be inserted on the grid. The transmission upgrade capacity is motivated by several factors as meeting the increasing electricity demand, increasing the reliability of the system and providing non-discriminatory access to cheap generation for consumers. However, TEP problems have been changing over the years as the electrical system evolves. In this way, this paper provides a detailed historical analysis of the evolution of the TEP over the years and the prospects for this challenging task. Furthermore, this study presents an outline review of more than 140 recent articles about TEP problems, literature insights and identified gaps as a critical thinking in how new tools and approaches on TEP can contribute for the new era of renewable and distributed electricity markets.

Index Terms- Heuristics; Optimization; Mathematical programming; Metaheuristic; Transmission expansion planning

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Citation:

Vilaça, P.; Tomé Saraiva, J.P. "State-of-the-art of Transmission Expansion Planning: a survey from restructuring to renewable and distributed electricity markets", International Journal of Electrical Power & Energy Systems, vol.111, pp.411-424, October, 2019.