# An analysis of the marginal value of electricity transmission lines in the dispatch: possible applications

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**Abstract-**

**The marginal value of transmission lines in the dispatch is widely used in the literature and has relevant practical applications related to planning the expansion of the transmission grid and computing the remuneration ofmerchant lines.This paper presents a general formulation of the marginal value of a line in the dispatch that highlights the dependence of this value on the link between line admittance and capacity. We discuss the value of a line according tomarginal principles following a general approach and prove that only if the admittance of a line can be expressed as a linear function of its capacity, orwhen admittance and capacity can be deemed independent, is this value equal to the product of the difference between marginal electricity prices at both ends of the line and the flow through this line. Afterwards,we showthat under a set of stylized conditions the remuneration of efficient network investments according to their marginal value in the dispatch should result in an exact recovery of their cost. Finally, we compute the marginal value of lines in a stylized, though representative, system for several relationships between line capacities and admittances to illustrate the theoretical results obtained.**

**Index Terms- Electricity transmission, marginal pricing, network expansion.**

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