

# Distribution feeder costs as a function of the penetration of distributed generation - key drivers and trends

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## Abstract

Distributed generation (DG) has experienced extraordinary growth in installed capacity in many countries. DG can have a significant impact on both the investment and operational costs of distribution feeders. However, in many contexts, such impact is still not clear. Moreover, the impact of DG could be positive or negative and could be different for different levels of DG penetration. This paper proposes a high-level approach to estimate the cost of distribution feeders as a function of the DG penetration scenario, for different types of medium voltage grids. Grid scenarios include urban and rural feeders, intermittent and conventional DG technologies, different distributions of loads and DG along the feeder, and passive and active voltage regulation. For each grid scenario, we build the curve of total feeder cost as a function of the penetration of DG. We identify the levels of the penetration that create savings and the levels that drive additional costs. We find that, for all the explored medium voltage grids, DG creates savings for low penetration scenarios, but increases the total feeder cost for higher penetrations, which is largely driven by the increase in power losses. We finally discuss the possible policy implications of the resulting cost curves.

## Palabras clave

**KeyWords Plus:** [DISTRIBUTION NETWORKS](#); [MODEL](#)

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