



# Methodological Evaluation of Power-Distribution Equipment Systems in Ghana Using Difference-in-Differences for Efficiency Assessment

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### Abstract

Power distribution equipment (PDEs) play a critical role in ensuring reliable electricity supply in Ghana's power grid. We applied econometric techniques to assess changes in PDE performance before and after specific interventions. The DiD regression model will be used to estimate treatment effects on system efficiency gains. A preliminary analysis suggests that the DiD approach can identify significant differences in system efficiency between regions, indicating potential disparities in infrastructure quality and maintenance practices. The DiD method provides a robust framework for understanding how PDE systems have evolved over time under different governance conditions. Policymakers should prioritise data collection on specific components of the power grid to enhance diagnostic accuracy in future evaluations. Power Distribution Equipment, Efficiency Assessment, Difference-in-Differences, Ghana The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Geographic, econometric, efficiency, infrastructure, power distribution, difference-in-differences, African*

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