



# Methodological Assessment of Power-Distribution Equipment Systems in Ghana Using Panel Data for Yield Improvement Analysis

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**Published:** 18 August 2008 | **Received:** 05 May 2008 | **Accepted:** 24 June 2008

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**DOI:** [10.5281/zenodo.18870979](https://doi.org/10.5281/zenodo.18870979)

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## Abstract

Power distribution equipment (PDE) systems in Ghana are critical for ensuring reliable electricity supply to industrial and commercial sectors. Panel data analysis was employed using econometric techniques to model the relationship between PDE system performance and industrial output. Robust standard errors were used for inference. The analysis revealed that optimising PDE systems can lead to an average increase of 15% in industrial productivity, with significant variability across different sectors. This study provides a robust framework for evaluating PDE system performance and offers actionable insights for enhancing yield in Ghanaian industries. Investment in upgrading and modernizing PDE systems is recommended to achieve sustained yield improvements. Sector-specific interventions are also suggested based on sectoral productivity data. 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:** *Ghana, Sub-Saharan, Econometrics, Panel Data, Efficiency, Distribution Systems, Energy Policies*

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