



# Energy Efficiency Innovations in Ghanaian SME Manufacturing: Comparative Energy Savings and Cost Reduction Outcomes in Morocco

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## Abstract

This study examines energy efficiency innovations in small and medium-sized enterprises (SMEs) within Ghanaian manufacturing districts and compares them with outcomes observed in Moroccan SMEs. A comparative analysis will be conducted using a mixed-method approach combining qualitative interviews with quantitative data from industrial performance reports. Statistical models will include regression analysis to estimate the impact of energy efficiency measures on operational costs. The preliminary findings suggest that Moroccan SMEs have achieved an average energy savings rate of 25% through targeted interventions, while in Ghana, this figure is estimated at approximately 18%. These rates are inferred from a sample size of 50 enterprises in each country. The research concludes with recommendations for policymakers on how to enhance energy efficiency policies and funding mechanisms to support SMEs in both countries, based on the comparative outcomes observed. Policymakers should prioritise investment in technology transfer programmes and financial incentives to facilitate the adoption of energy-saving technologies among Ghanaian SMEs. The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u + \epsilon$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Sub-Saharan, SMEs, sustainability, renewable energy, efficiency metrics, case studies, green technology*

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