A multi-methods framework for profitability assessment of energy efficiency investments under uncertainty

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Abstract: Mainstreaming energy efficiency (EE) investments requires to persuade investors regarding their profitability potential. However, EE investments are subject to various risks, which may affect involved actors' profits and create uncertainty. In this regard, a methodological framework for profitability assessment of EE investments under uncertainty is necessary to support their investment decisions. The methodological framework is based on a multi-methods approach, combining: financial analysis of EE investments using the Project Internal Rate of Return (IRR), risk assessment through quantitative and qualitative techniques, and analysis of investors' preferences in terms of minimum required return and maximum accepted holding period. Utilising this framework, investors can identify whether investigated EE investments can be profitable and their profitability level. In the context of this study, the methodology is applied to financial data for EE investments implemented in Germany, retrieved from the De-risking Energy Efficiency Platform (DEEP) database, an open-source database for EE investments performance monitoring and benchmarking. The results indicate that (i) investments realised in the industrial sector of Germany financially outperform those in the buildings sector, (ii) macroeconomic risk is a significant factor with regards to the uncertainty of EE investments, and (iii) separate investor profiles entail different preferences under distinct risk levels.