

**TECHNOLOGICAL AND COST EFFECTIVE
SELECTION PROCEDURE FOR RURAL
ELECTRIFICATION SYSTEMS**

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Declaration

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Abstract

In most of the countries cost of rural electrification from grid extension is very high. This is mainly due to improper planning and lack of knowledge on low cost distribution technologies. Most of the African countries have followed European standards for their medium voltage distribution networks. But these standards were developed for high density, high demand centers in European countries. This often leads to oversized distribution networks with unnecessarily high costs for rural electrification projects. Therefore benefit to cost ratio of these projects are very low. With deregulation and restructuring process, distribution companies may not invest on low benefit rural electrification projects. Hence it is essential to introduce low cost technologies in order to promote rural electrification projects.

The objective of this project is to help in reducing the high costs of electrification by introducing a technological and cost-effective selection procedure for rural electrification systems.

By analyzing various alternative methods introduced for rural electrification systems and comparing those with traditional distribution systems, an algorithm is developed to select optimum electrification method for rural areas based on their technology and cost. Based on this algorithm software is also developed to select the optimum network technology in more user-friendly manner.

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List of Abbreviations

A	- Ampere
AAAC	- All Aluminum Alloy Conductor
AAC	- All-aluminum conductor
ACSR	- Aluminium Conductor Steel Reinforced
ENPI	- The European Neighborhood and Partnership Instrument
GMD	- Geometric Mean Distance
GMR	- Geometric Mean Radius
HV	- High Voltage
IEA	- International Energy Agency
kV	- kilovolt
kVA	- kilovolt-ampere
kW	- kilowatt
kWh	- kilowatt hour
LV	- Low Voltage
m	- meter
mm	- millimeter
MV	- Medium Voltage
NESC	- National Electric Safety Code
NRECA	- National Rural Electric Cooperative Association
OECD	- Organization for Economic Co-operation and Development
REA	- Rural Electrification Administration
SWER	- Single Wire Earth Return
SWS	- Shield Wire System
W	- Watt
WEO	- World Economic Outlook



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