

REVIEWER'S REPORT

Manuscript No.: IJAR-54958

Title: MISE EN PLACE D UNE STRATEGIE D ELECTRIFICATION EN COTE D IVOIRE A LA LUMIERE DES SOURCES D ENERGIE,

Recommendation:

Accept after major revision

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer Name: Dr.K.Arumuganainar

Date: 27.11.2025

Detailed Reviewer's Report

DETAILED REVIEW REPORT

1. Overall Assessment

The manuscript presents a broad descriptive analysis of energy resources in Côte d'Ivoire and proposes an electrification strategy based on available solar, hydro, biomass, fossil fuel, and decentralised technologies. This topic is crucial for African energy planning and supports sustainable development goals (SDG 7: Affordable and Clean Energy).

However, the paper is **more descriptive than analytical**, lacking quantitative modelling, empirical validation, economic cost-benefit simulations, and any clear methodology for strategy optimization. The manuscript would require significant structural and scientific improvements before being considered publishable.

Recommendation: Major Revision

2. Strengths of the Manuscript

✓ Relevance

The topic is highly relevant to rural electrification challenges in sub-Saharan Africa.

✓ Extensive Compilation of National Energy Data

The manuscript collects data on:

- Hydro potential
- Solar irradiation
- Biomass residue capability
- Fossil reserves
- Existing and planned projects

These datasets provide good background for an electrification framework.

✓ Inclusion of an Electrification Decision Flowchart

The organigram (Fig. 8) offers a systematic representation of possible electrification options based on location and distance to the grid.

✓ Clear Explanation of Electrification Technologies

Includes detailed descriptions of:

- Centralised grid extension
 - Decentralised mini-grids
 - Solar PV systems
 - Diesel generator systems
 - Hybrid systems
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3. Major Comments (Require Mandatory Revision)

3.1 Lack of a Scientific or Analytical Methodology

The manuscript claims to develop an “optimal strategy”, but:

- No optimisation model is presented.
- No metrics (LCOE, NPV, TRIE, ROI) are calculated.
- No simulation tools (HOMER, RETScreen, PVSyst, MATLAB) are used.
- No cost comparison between technologies is performed.

The paper remains descriptive and not analytical, which is critical for an “optimal strategy”.

3.2 Results Section Is Not Supported by Numerical Analysis

The “Results & Discussion” section only describes:

- Existing networks
- Energy potentials
- General electrification concepts

But no quantitative output is presented.

Missing elements:

- Estimated rural load profiles
 - Cost of electrification options
 - Optimal distance threshold for grid vs. off-grid
 - Case studies of specific villages
 - Sensitivity analysis (fuel cost, solar variability, demand growth)
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3.3 No Real Case Application

The study would be stronger with:

- A real village
- Real demand calculation
- Real distance to grid
- A comparison between solar mini-grid, diesel, and grid extension

Currently, the work is **generic**.

3.4 Figures and Tables Need Improvement

Several figures are low resolution and lack:

- Units
- Captions
- Sources
- Readable axes

Tables lack:

- Data references
- Explanation

- Consistent formatting
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3.5 Literature Review Requires Expansion

Most references are old or general. Missing:

- Modern electrification models (2020–2024)
 - Comparative studies on mini-grid economics
 - Off-grid rural electrification case studies in Africa
 - Solar-diesel hybrid analysis papers
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3.6 Language and Presentation Errors

Frequent issues include:

- Long paragraphs without structure
 - French grammar inconsistencies
 - Undefined variables in equations
 - Repetitive sentences
 - Missing transitions in sections
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4. Minor Comments

- Keywords should be alphabetically arranged.
 - Add abbreviations list (HTA, BT, TRIE, etc.).
 - Add proper referencing format (consistent numbering).
 - Add units for all quantitative values (e.g., MW, GWh).
 - Correct formatting inconsistencies (spacing, alignment, figure placement).
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5. Suggestions for Improvement

5.1 Include a Quantitative Optimization Model

Examples:

- Levelized Cost of Energy (LCOE) comparison
- HOMER simulation of hybrid systems
- Multi-Criteria Decision Analysis (MCDA)
- Technoeconomic modelling

5.2 Add a Case Study

Select one real village in Côte d'Ivoire and evaluate:

- Load estimation
- Distance to grid
- Cost of solar mini-grid vs. diesel vs. extension

5.3 Redraw Organigram with Clearer Logic

Include:

- Threshold distances
- LCOE comparisons
- Demand segmentation

5.4 Improve the Conclusion

Add:

- Practical recommendations
- Policy suggestions
- Future research directions

6. Final Recommendation

Recommendation: MAJOR REVISION

The paper is relevant and well-structured but lacks analytical depth. Authors must include quantitative modelling, updated references, and a stronger results section to justify the proposed “optimal strategy”.