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REVIEWER'S REPORT

Manuscript No.: **IJAR-54065** Date: **27.09.2025**

Title: Energy efficiency and automation of electricity payment with the use of smart meters

Recommendation:
Accept after minor revision .....

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

Reviewer Name: Dr.K.Arumuganainar **Date: 27.09.2025**

Reviewer's Comment for Publication.

- **Decision: Accept with Minor to Moderate Revisions**
- **Key Revisions Required:**
  1. Improve abstract with quantitative highlights.
  2. Add methodological details (sampling, reliability, ethics).
  3. Refine discussion with comparative analysis.
  4. Reduce redundancy in case studies and conclusion.
  5. Standardize references.

Detailed Reviewer's Report

Review Report

Title

The title is clear and relevant. It conveys both the core subject (energy efficiency and smart meters) and the applied context (automation of electricity payment). However, the phrase could be made more concise, e.g., *"Enhancing Energy Efficiency and Automating Electricity Payment through Smart Meters."*

Abstract

- The abstract provides a good overview of the study: context (Togo, prepaid meters), challenges (billing and alert issues), methodology (survey and research), and solution (smart meters with ICT integration).
- However, it is **slightly descriptive** and could benefit from more **quantitative results** (e.g., key survey statistics) and **explicit findings** (how smart meters improved user satisfaction or operational efficiency).

Introduction

- The introduction is well-framed, beginning with the background of electricity usage in Togo and the problems with traditional/postpaid meters.
- The research gap is clear: prepaid meters solve billing issues but create difficulties for users (lack of alerts, remote recharge, etc.).
- The justification for the study is strong and well-motivated.

Suggestion: Strengthen the literature connection early by briefly highlighting global smart meter advancements before moving into the case of Togo.

Background and Objectives

- Provides important context: Togo's electricity demand projections, CEET's adoption of prepaid meters, and user complaints.
- The objectives are clear and structured around user needs: real-time monitoring, remote recharge, and feedback collection.
- The inclusion of real-life cases (barman, shopkeeper) is good for illustrating practical problems, though they could be shortened for conciseness.

Literature Review

- Covers international research and applications of smart meters effectively.
- Highlights their **technical features** (two-way communication, remote reading, demand-side management, tariff flexibility, outage detection).
- References are recent (2020–2023), showing updated scholarship.
- Integration of AI, DERs, and privacy concerns are appropriately discussed.

Suggestion:

- The review could be **better synthesized** by identifying clear research trends and gaps, rather than listing studies sequentially.
- Some references (e.g., [1], [2]) are theses/dissertations, which may not carry the same weight as peer-reviewed journal articles. Consider strengthening with more high-impact journal sources.

Methodology

- The methodology relies on surveys of 3,000 CEET prepaid meter users, with 2,800 valid responses.
- Use of Google Forms and focus on quantitative + qualitative responses is valid.
- Sample size is robust; however, **details on sampling technique** (random, stratified, or convenience) are missing.
- The questionnaire (10 questions) is well-designed, covering awareness, habits, challenges, and user needs.

Suggestion: Clarify:

1. How respondents were selected.
2. Reliability/validity measures (e.g., Cronbach's alpha for survey items).
3. Ethical considerations (informed consent, anonymity).

Results and Discussion

- Findings are well-documented in tables and figures (e.g., 72% use prepaid meters, 74% face unexpected outages, 96% want monitoring applications, 97% want alerts).
- The results strongly justify the proposed smart meter solution.
- Interpretation is adequate, but could be strengthened by comparing results with similar studies in other countries.

Solutions and Contributions

- Proposes integrating smart meters with ICT/web/mobile applications for:
    - Remote recharge
    - Real-time monitoring
    - Alerts and notifications
    - Automated energy purchase
- This is a **practical and scalable solution**, aligning with global best practices.
- Acknowledges investment challenges for CEET but frames them as long-term beneficial.

Suggestion: Add a **cost-benefit analysis** or pilot test data to strengthen practical feasibility.

Conclusion

- Summarizes the contribution well: combining smart meters and IT applications to improve electricity management.

- Considers future directions (AI integration, distributed generation).
- However, it is somewhat **repetitive** of the abstract and could be made more concise, emphasizing the study's unique contributions.

References

- The reference list includes both international journal articles and local reports.
- Recent and relevant (2020–2023), which is a strong point.
- Formatting needs slight corrections (inconsistencies in citation styles, e.g., some URLs are left in-text, some have DOI, some not).

Strengths

1. Relevant and practical study with strong local context (Togo).
2. Large survey sample (2,800 respondents).
3. Clear articulation of user challenges and needs.
4. Proposed solution is innovative and aligned with global smart grid trends.
5. Literature review covers diverse international experiences.

Weaknesses

1. Lack of methodological detail (sampling, validation, ethics).
2. Results discussion could integrate more **comparative insights**.
3. Absence of cost-benefit or feasibility analysis for proposed solutions.
4. Some language/grammar issues and redundancy.
5. References need formatting consistency.

Recommendation

- **Decision: Accept with Minor to Moderate Revisions**
- **Key Revisions Required:**
    1. Improve abstract with quantitative highlights.
    2. Add methodological details (sampling, reliability, ethics).
    3. Refine discussion with comparative analysis.
    4. Reduce redundancy in case studies and conclusion.
    5. Standardize references.

 Overall Evaluation:

This is a well-structured and timely study that addresses an important real-world challenge of electricity access and management in Togo, with global implications. With some refinements in methodology transparency, reference formatting, and tighter writing, the paper would be suitable for publication.