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Peer Review

Review of: "Dynamic and Power-Quality Impacts of High Photovoltaic Penetration on Distribution Feeders That Static Load-Flow Studies Overlook"

Mathewos Lolamo[1]

1. Wachemo University, Hosaena, Ethiopia

The manuscript entitled, **"Dynamic and Power-Quality Impacts of High Photovoltaic Penetration on Distribution Feeders That Static Load-Flow Studies Overlook"** presents a timely review of the impacts of high photovoltaic (PV) penetration on distribution feeders beyond conventional steady-state load-flow analysis. The manuscript provides a comprehensive literature-based discussion on the limitations of steady-state load-flow analysis and highlights the importance of considering dynamic behavior, harmonics, and smart inverter functions. It also addresses dynamic voltage behavior, cloud-induced variability, harmonic distortion, and inverter-based mitigation techniques under IEEE 1547-2018. The manuscript is generally well organized, easy to follow, and provides a useful synthesis of the literature. However, several technical and methodological issues should be addressed before the manuscript is suitable for publication. The review requires a more systematic methodology, deeper critical analysis of the literature, broader coverage of recent developments, and stronger evidence supporting several conclusions.

1. The manuscript is presented as a structured literature review; however, the methodology lacks sufficient detail regarding literature selection.
2. How many papers were initially identified and finally included?
3. Which databases (IEEE Xplore, Scopus, Web of Science, ScienceDirect, etc.) were searched? What were the inclusion and exclusion criteria? What publication years were considered?
4. A PRISMA-style flowchart or systematic review framework would significantly improve the scientific rigor of the review.

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5. Although the manuscript claims to fill an important research gap, the novelty over existing review papers is not sufficiently established.
6. Please explicitly compare this review with recent review articles on PV hosting capacity, dynamic analysis, and power quality, and clearly explain the unique contribution of this manuscript.
7. Could the authors include a more critical discussion highlighting strengths and weaknesses of previous studies, unresolved technical challenges, conflicting conclusions, and remaining research gaps?
8. Many cited references are relatively old (2014–2021), while this is a rapidly evolving research field. Please incorporate more recent literature (2023–2026), particularly regarding power quality improvement, smart inverter control, AI-based voltage regulation, and advanced hosting capacity assessment.
9. The manuscript discusses dynamic phenomena but does not sufficiently distinguish among quasi-static time-series simulation, electromagnetic transient (EMT) simulation, RMS dynamic simulation, and real-time digital simulation. Which simulation approaches are most appropriate for studying the various dynamic phenomena discussed?
10. The mitigation discussion mainly focuses on smart inverters and filters. Please discuss recent mitigation approaches including battery energy storage, community energy storage, virtual power plants, coordinated Volt/VAR optimization, distributed optimization, and adaptive inverter control.
11. Several figures appear to have relatively low resolution. Please ensure all figures have appropriate permissions, higher resolution, and consistent formatting.
12. Equation numbering and formatting should be made more consistent throughout the manuscript.
13. The comparison tables improve readability. Could an additional table summarizing simulation tools, network types, penetration levels, major findings, and limitations be added for all reviewed studies?

Declarations

Potential competing interests: No potential competing interests to declare.