

## A Comprehensive Overview of Solar and Vertical Axis Wind Turbine Integration Micro-Grid

**Authors :** Adnan Kedir Jarso, Mesfin Megra Rorisa, Haftom Gebreslassie Gebregwergis, Frie Ayalew Yimam, Seada Hussen Adem

**Abstract :** A microgrid is a small-scale power grid that can operate independently or in conjunction with the main power grid. It is a promising solution for providing reliable and sustainable energy to remote areas. The integration of solar and vertical axis wind turbines (VAWTs) in a microgrid can provide a stable and efficient source of renewable energy. This paper provides a comprehensive overview of the integration of solar and VAWTs in a microgrid. The paper discusses the design, operation, and control of a microgrid that integrates solar and VAWTs. The paper also examines the performance of the microgrid in terms of efficiency, reliability, and cost-effectiveness. The paper highlights the advantages and disadvantages of using solar and VAWTs in a microgrid. The paper concludes that the integration of solar and VAWTs in a microgrid is a promising solution for providing reliable and sustainable energy to remote areas. The paper recommends further research to optimize the design and operation of a microgrid that integrates solar and VAWTs. The paper also recommends the development of policies and regulations that promote the use of microgrids that integrate solar and VAWTs. In conclusion, the integration of solar and VAWTs in a microgrid is a promising solution for providing reliable and sustainable energy to remote areas. The paper provides a comprehensive overview of the integration of solar and VAWTs in a microgrid and highlights the advantages and disadvantages of using solar and VAWTs in a microgrid. The paper recommends further research and the development of policies and regulations that promote the use of microgrids that integrate solar and VAWTs.

**Keywords :** hybrid generation, intermittent power, optimization, photovoltaic, vertical axis wind turbine

**Conference Title :** ICECSE 2024 : International Conference on Energy Conservation and Solar Energy

**Conference Location :** Vancouver, Canada

**Conference Dates :** May 20-21, 2024