



**ENERGY MANAGEMENT SYSTEM FOR
SMALL-SCALE HYBRID WIND-SOLAR
BATTERY-BASED MICROGRID**



A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

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in

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BONAFIDE CERTIFICATE

Certified that this project work titled "ENERGY MANAGEMENT SYSTEM FOR SMALL SCALE HYBRID WIND SOLAR BATTERY BASED MICROGRID" is the bonafide work of AJITH KUMAR.M (710419105002), GOPINATH.A (710419105014), RAHUL.M (710419105031) who carried out the project work under my supervision.

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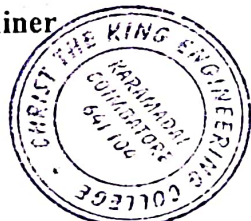
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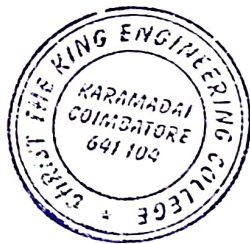



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ABSTRACT

This abstract provides an overview of an energy management system (EMS) designed for a small-scale hybrid wind-solar battery-based microgrid. The EMS aims to optimize the operation and utilization of energy resources within the microgrid by coordinating and controlling its various components. Key functionalities of the EMS include resource monitoring, load forecasting, energy dispatch and control, battery management, grid interaction, fault detection and protection, data analytics and optimization, and a user-friendly human-machine interface. By effectively managing energy generation, storage, and consumption, the EMS enables efficient and sustainable operation of the microgrid. Implementation of the EMS involves hardware and software components tailored to the specific requirements of the microgrid. The abstract emphasizes the importance of designing and configuring the EMS to ensure optimal performance and reliability in small-scale hybrid wind-solar battery-based microgrid systems.

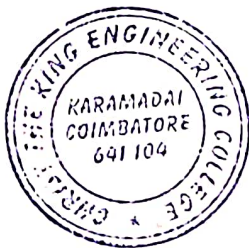


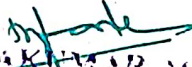

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CHAPTER 6

CONCLUSION

Interleaving of power converters has been proven as a potential solution to improve efficiency, reliability and transient response. This paper has proposed an interleaved topology for the widely accepted converter. A prototype of 50 Watt is built to validate the theoretical analysis. Proposed topology can significantly reduce the conduction loss through interleaving, thereby increasing the overall efficiency of the converter. Power density of the converter can also be increased since the total current in the boost stage is shared by two inductors. This results in reduction in size of the magnetics. It can also increase reliability of the converter, because of the presence of two interleaved phases.




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