

DYNAMIC MODELLING AND SIMULATION OF HYBRID POWER SYSTEMS BASED ON RENEWABLE ENERGY

*A project report submitted in partial fulfillment of the requirements
For the award of the degree of*

BACHELOR OF TECHNOLOGY IN ELECTRICAL & ELECTRONICS ENGINEERING

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CERTIFICATE

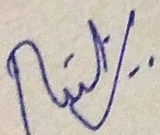
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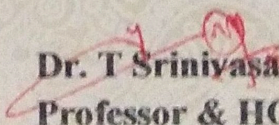
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ABSTRACT

This work describes dynamic modeling and simulation results of a renewable energy based hybrid power system. The paper focuses on the combination of solar cell (SC), wind turbine (WT), fuel cell (FC) and ultra-capacitor (UC) systems for power generation. As the wind turbine output power varies with the wind speed and the solar cell output power varies with both the ambient temperature and radiation, a FC system with an UC bank can be integrated to ensure that the system performs under all conditions. Excess wind and solar energies when available are converted to hydrogen using an electrolyzer for later use in the fuel cell. Dynamic modeling of various components of this isolated system is presented. Transient responses of the system to step changes in the load, ambient temperature, radiation, and wind speed in a number of possible situations are studied.