A PROPOSAL SEMINAR

DESIGN AND CONSTRUCTION OF A MOBILE INVERTER SYSTEM WITH MULTI-OUTPUT CAPABILITY AND ENERGY STORAGE OPTIMIZATION

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PRESENTATION OUTLINE

- INTRODUCTION
- STATEMENT OF THE PROBLEM
- AIM AND OBJECTIVES OF THE PROJECT
- DESIGN METHODOLOGY

INTRODUCTION

Power inverter system is a clean, eco-friendly and cheap source of alternative power system in a long term consideration. Coupled with the natural availability of it prime source of energy: the sun intensity. The inverter system has gain tremendous attention due to it applicability in:

- ❑ Offices
- ❑ Homes
- ❑ Schools
- ❑ Hospital etc.

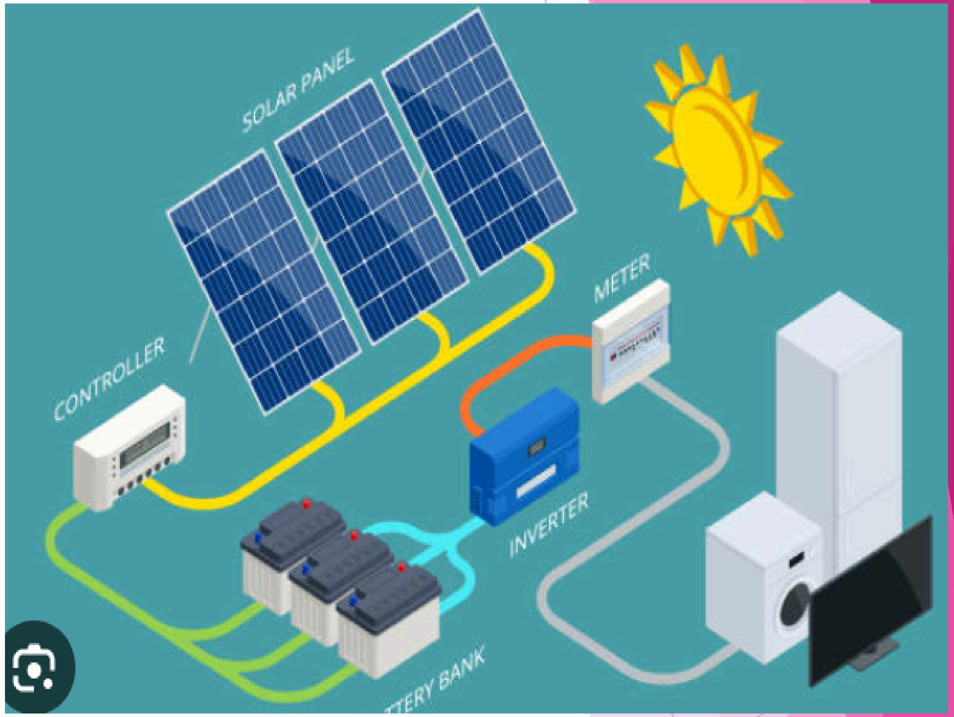

Figure 1: Standalone Inverter System

INTRODUCTION (cont’d)

The gasoline generator has equally provided backup to the mains power source over years and they have been produces in different rating and version. However they have been associated with some disadvantages:

- ❑ Noise Pollution
- ❑ Carbon-Dioxide Emission
- ❑ High Cost of Maintenance
- ❑ High running Cost (pms)
- ❑ High Start-up time for critical services

Figure 2: Gasoline Generator Sets

PROBLEM STATEMENT

- The continuous reliance on gasoline generators is increasingly impractical due to the above stated disadvantages and of which the small and medium-sized enterprises, in particular, need reliable, affordable, and adaptable energy alternatives.
- Therefore, this project work focuses on developing a renewable-based mobile inverter power supply system with multi-output supply capability and energy storage optimization, offering a flexible, environmentally friendly solution suited to various power needs and applications.

AIM OF THE PROJECT

This project seeks to design and construction of a 1.5 kVA mobile inverter system capable of offering multiple source outlets.

OBJECTIVES OF THE PROJECT

The objectives of this project work are to:

- design and construction of an efficient 1.5 kVA mobile inverter system
- design an efficient battery system
- design a modular mobile inverter that is easily scalable and adaptable for various power requirements
- evaluate and validate the mobile inverter's performance

METHODOLOGY

The project will be executed through the following key steps:

i. To design an efficient 1.5 kVA mobile inverter system.

We will consult passed literatures to develop technical specifications and design an efficient circuit for the inverter system as depicted in the block diagram of Figure 3.

ii. To design an efficient battery system

A battery rating of 14.8 volts, 40 AH battery system is proposed for the mobile inverter using a 7.4 volts, 5200 mAH lithium cells.

$$Two\ cells\ combined\ in\ series = 2\ x\ 7.4\ v = 14.8v\ still\ at\ 5.2\ AH$$

$$Eight\ cells\ combined\ in\ parallel = 8\ x\ 5.2\ AH = 44\ AH\ still\ at\ 14.8v$$

A proposed 14.8 volts 44 AH

METHODOLOGY (Cont'd)

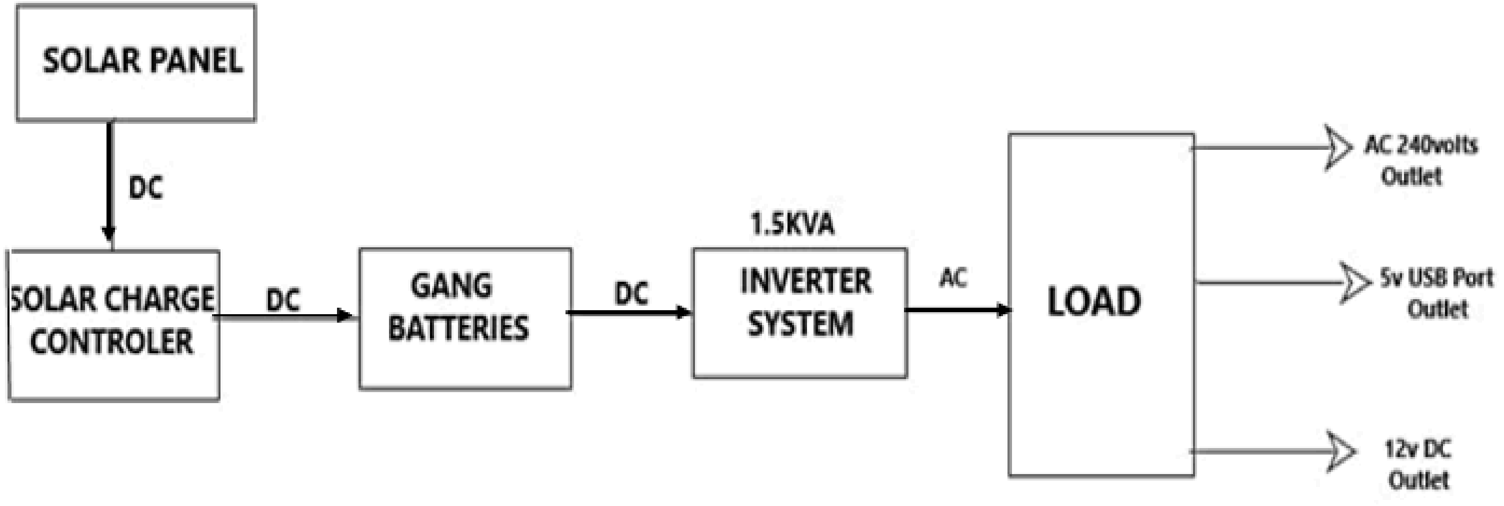

Figure 3: The Block Diagram of 1.5 kVA Mobile Solar Inverter System

METHODOLOGY (Cont’d)

iii. design a modular mobile inverter that is easily scalable and adaptable for various power requirements

Identify target applications (e.g., renewable energy systems, electric vehicles, backup power), Determine power requirements (range: 1.5kVA).

iv. evaluate and validate the mobile inverter's performance.

The following tests of Output Voltage Regulation (OVR), Working Duration Span (WDS) and Thermal Raise (TR) will be done in comparison to the Standardizing testing available in literatures.

Thank You For Listening

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