

HYBRID SOLAR POWER

Submitted in partial fulfillment of the requirements for the completion of

PROFESSIONAL TRAINING

by

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SCHOOL OF ELECTRICAL AND ELECTRONICS

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with grade "A++" by NAAC

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SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE

BONOFIDE CERTIFICATE

This is to clarify that this Internship Report submitted for EPICS is the bonafide work of SANGEETHA S (REG NO 41140076), who carried out the Internship during the period May 2023 to June 2023.

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DECLARATION

I am **SANGEETHA S** here by declare that the Report entitled **HYBRID SOLAR POWER** done by me at **HYBRID POWER SOLUTIONS, ERODE** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in **ELECTRICAL AND ELECTRONICS ENGINEERING**.

DATE : 25-05-2023 to 03-06-2023

PLACE : ERODE



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SIGNATURE OF THE CANDIDATE

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CHAPTER 1

INTRODUCTION ABOUT THE COMPANY

This company established by 2018,Hybrid Power Solutions has gained immense expertise in offering R.o Water System,Solar Water Heater,Off Grid Solar Power Plants,Panasonic Solar Panels,Industrial Online ups etc..The company located in Erode,Tamilnadu and providing R.o Systems,Solar Water Heater,Industrial Online ups to the clients.

1.1 VISSION OF THE COMPANY

Hybrid power systems (HPS) assure continuous power supply to the end users.These systems consist of more than one energy source like solar photovoltaic,and with and without battery backup.

1.2 MISSION OF THE COMPANY

Hybrid systems provide a high level of energy security through the mix of generations methods,and often will incorporate a storage system (battery,fuel cell) or small fossil fueled generator to ensure maximum supply reliability and security.

CHAPTER 2

NATURE OF WORK DONE

1) SUNLIGHT ACTIVATES THE PANELS:

Each individual panel is constructed of a layer of silicon cells,a metal frame,a glass casing surrounded by a special film,and wiring.For maximum effect,the panels are grouped together into placed on rooftops or in large outdoor spaces.

2) THE CELLS PRODUCE ELECTRICAL CURRENT:

Within each solar cell is a thin semiconductor wafer made from two layers of silicon.One layer is positively charged,and the other negativity charged,forming an electric field.

3) THE ELECTRICAL ENERGY IS CONVERTED:

The solar panels working efficiently to transform sunlight into electricity,but the electricity generated is called direct current electricity,which is not the type of electricity that powers most homes,which is alternating current electricity.

4) THE CONVERTED ELECTRICITY POWERS YOUR HOME:

Once the solar energy has been converted from DC to AC electricity,it runs through your electrical panel and is distributed within the home to power your appliances.

5) A NET METER MEASURES USAGE:

On cloudy days and overnight,our solar shingles or panels may not be able to capture enough sunlight to use for energy;in the middle of the day whwn nobody is home,they may collect surplus energy -more than you need to operate your home.This is known as net metering.

CHAPTER 3

METHODS AND PROCESSES

Solar technologies convert sunlight into electrical energy either through photovoltaic (PV) panels or through mirrors that concentrate solar radiation. This energy can be used to generate electricity or be stored in batteries or thermal storage.

3.1 TYPES OF METHODS

The Three methods of solar energy conversion are:

- Producing chemical fuel via artificial photosynthesis,
- Generating electricity by exciting electrons in a solar in a solar cell, and
- Concentrating sunlight to produce heat.

The Three main types of solar power systems are:

- On -grid -also known as a grid-tie solar system,
- Off-grid-also known as a stand-alone power system,
- Hybrid Solar system with battery storage with grid-connection.

CHAPTER 4

KNOWLEDGE AND EXPERIENCE

I gained to in-depth of knowledge of hardware and this expertise can lead to rewarding career opportunities, and the solar energy is a form of renewable energy that is generated by harnessing the power of the sun's rays. This energy is converted into electricity through the use of the use solar panels, which are made up of photovoltaic cells that convert sunlight into electrical energy. Solar energy is a clean and sustainable form of energy, as it does not produce any greenhouse gases or pollutants, and it does not deplete any natural resources. It is becoming increasingly popular as a source of electricity for home and businesses, and it is also used in a variety of industrial and transportation applications.

4.1 HYBRID SOLAR POWER

4.1.1 WHAT IS A SOLAR POWER PLANT AND WHY IT'S IMPORTANT?

A solar plant is a facility that converts solar radiation, made up of light, heat, and ultraviolet radiation, into electricity suitable to be supplied to homes and industries.

The solar plant importance are it has to be a renewable, clean source of electricity. Solar power is scale. This means that it can be deployed on an industrial scale, or it can be used to power a single household.

4.1.2 TYPES OF SOLAR POWER PLANT

The 5 main types of solar energy are:

- ✓ Photovoltaic (PV) Solar Energy,
- ✓ Solar Thermal Energy (STE),
- ✓ Concentrated Solar Power (CSP),
- ✓ Passive Solar Energy, and

- ✓ Building - integrated Photovoltaic (BIPV)

4.1.3 BEFEFITS TO USED SOLAR POWER PLANT

- ✓ Solar energy is clean & green energy,
- ✓ Not dependent on other sources of energy,
- ✓ Non-maintaninence,
- ✓ Safer than offer,
- ✓ Renewable Energy,
- ✓ Electricity Bill Reduction,
- ✓ Maximum Usage,
- ✓ Technology Development.

4.1.4 ADVANTAGES AND DISADVANTAGES

The advantages are,

- An energy source that is both renewable and inexhaustible by definition,
- Everywhere gets sunlight,
- It's very well suited to batteries and the electricity grid,
- The sun creates local wealth and jobs,
- Technological versatility,
- Minimal maintenance required,
- Green until the end of the life.

The disadvantages are,

- Cost, The initial cost of purchasing a solar system is fairly high,

- Weather-dependent. Although solar energy can still be collected during cloudy and rainy days, the efficiency of the solar system drops,
- Solar energy storage is expensive,
- Uses a lot of space,
- Associated with pollution.

4.1.5 APPLICATIONS OF SOLAR POWER PLANT

The applications of the solar power plants are:

- Solar water heating,
- Solar thermal collector,
- Solar cooker,
- Solar still,
- Water heating.

4.1.6 FUTURE SCOPE

- The price of the solar panels will continue to fall, making it more affordable for individuals and businesses.
- Solar power will become an increasingly important source of electricity, particularly developing countries where it can help to reduce on fossil fuels and improve access to electricity.
- The use to solar energy will continue to grow in the transportation sector with the development of solar - powered and the use of solar panels for electric power technologies.

CHAPTER 5

CONCLUSION

Solar power is an immense source of directly usable energy and ultimately creates other energy resources: biomass, wind, hydro power and wave energy. Most of the Earth's surface receives sufficient solar energy to permit low-grade heating of water and buildings, although there are large variations with latitude and season. At low latitudes. The energy of light shifts electrons in some semiconducting materials. This photovoltaic effect is capable of large-scale electricity generation. However, the present low efficiency of solar PV cells demands very large areas to supply electricity demands.

CHAPTER 6

INTERNSHIP FOR COMPLETION



