REPORT

SOLAR ENERGY

Communication Technique, Interview and Group Discussion Lab

12 April 2018

Submitted by

PUNEET SALUJA

(2015KUCP1019)

Submitted to

DR. MEDHAVI JAIN

Acknowledgement

I would like to thank our teacher Dr. Medhavi Jain for giving me this opportunity to express our thoughts on the topic “Solar Energy” and also for motivating us to present our views on the same.

I would also like to thank my team members who worked passionately and gave their best to prepare the presentation before the deadline.

Preface

Solar is a safe alternative which can replace current fossil fuels like coal and gas for generation of electricity that produce air, water, and land pollution**.**

In this presentation, we have discussed what is solar energy, what are the possibilities of solar energy and how solar energy can act as a future source of energy. We have talked about the use of solar energy in various fields ranging from agriculture, medical, water treatment, solar vehicles to production of electricity.

We then discussed how India is advancing its production of solar energy and what steps India has taken at the national and international level to promote solar energy. We have discussed about National Solar Mission with which, India aims to produce 100 GW of solar energy by 2022. We have also talked about International Solar Alliances which was launched at the UN Climate Change Conference in Paris at the end of 2015 by the President of France and Prime Minister of India.

We Concluded in the end by discussing how solar energy has seamless possibilities in terms of energy production.

TABLE OF CONTENTS

1. Introduction

Solar energy is the energy that is produced by the sun in the form of heat and light. It is one of the most renewable and readily available source of energy on planet Earth. Traditionally, the world's electrical needs have been fulfilled fossil fuels like oil, natural gas, and coal. However, these energy sources cause global warming and acid rain pollution, which negatively impacts our environment. So, there arises a need of energy source like solar energy which is not only pollution free but also proves to be the most reliant source of energy in future.

2. Types of Solar Energy

Solar energy can be used to generate electricity in 2 ways: -

1) Thermal Solar Energy
   A solar thermal collector harnesses heat by absorbing the sun rays. This could be used to heat up water for home use such as water heaters and hot tubs. The concentrated solar power plants utilize this energy to produce electricity by heating a liquid to turn a turbine connected to a generator.

2) Photovoltaic Solar Energy

   This technique utilizes Solar Photovoltaic (PV) devices or solar cells that convert the sun's energy into electricity. Photovoltaic devices produce electricity right from the sunlight through an electronic process that naturally occurs in particular material types known as semiconductors. Electrons contained in these materials are let loose by solar rays are stimulated to travel via an electronic circuit, sending power to the grid or directly powering electrical devices. This form of energy can be used to power solar watches, calculators or traffic signals. They are often used in locations that are not connected to electricity grid.

3. Applications of Solar Energy

Solar energy has a number of applications such as: -

- Solar water heating
- Solar cooking
- Solar electric power generation
- Solar green houses
- Solar Vehicles
- Solar-distillation

3.1 Solar Energy in Agriculture

Solar energy can be used in agriculture to grow crops, for pumping water and drying crops. These applications of solar energy have reduced the dependency of farmers on electric grid and has helped farmers to reduce cost per crop.

Greenhouses: Greenhouses warm up during the day and helps in year-round production of crops requiring special environment conditions.

3.2 Solar Vehicles

Electric Vehicles can be powered completely or significantly by using solar energy. Solar Panels used in passenger cars in order to ventilate the car.

3.3 Solar Energy in Water Treatment

Solar energy can also be used in water purification process using methods such as Solar water disinfection, Solar water distillation and Solar water purification.

3.4 Solar Cooking

Solar cookers use sunlight for cooking. A basic box cooker consists of an insulated container with a transparent lid. It uses a reflective panel to direct sunlight onto an insulated container to heat the contents.

4. National Solar Mission

National Solar Mission is the part of the National Action Plan on Climate Change which aims to promote the development and use of solar energy. Initially target was set to produce 20 GW by 2022 which was later increased to 100 GW by the Narendra Modi Government.

5. International Solar Alliance

The initiative was launched at the UN Climate Change Conference in Paris at the end of 2015 by the President of France and the Prime Minister of India. 121 countries are part of this alliance. Main aim of is to promote solar technologies, and investment in the solar sector.

6. Advantages of Solar Energy

- Pollution free.
- Renewable.
- Safer than traditional electric current.
- Return on investment.
- Silent and non-polluting.
- Solar cells can be added when there is demand for more energy.
- Solar power causes less electricity loss.
- Solar power is a free source of energy.

7. Disadvantages of Solar Energy

- High initial cost.
- Takes a lot of solar panels to be efficient initially.
- Can only generate during the day.
- Lower production in the winter months.
- Depending on geographical location the size of the solar panels varies for the same power generation.
- Associated with pollution.
- Solar energy storage is expensive.

Conclusion

Since, the fossil fuels are non-renewable sources of energy. Therefore, there arises a need of an energy source which is not only non-polluting but also renewable so that the future needs of energy could be met. There are wide applications of solar energy ranging from agriculture, medical to water treatment. It is non-polluting, silent source of energy and needs less maintenance. Government of India has taken a major step in this direction to promote solar energy by forming International Solar Alliance. India aims to generate 200 GW of solar energy by 2022 which is a big task to achieve. According to scientific findings, the earth intercepts lots of solar power, 173 trillion terawatts to be specific. That's literally ten thousand more power than the entire world population utilizes. Thus, Solar Energy has seamless possibilities and proves to be the best source of energy.

References

https://www.conserve-energy-future.com/solarenergy.php

https://www.isolaralliance.org/

http://indianpowersector.com/electricity-regulation/national-solar-mission/

https://www.civicsolar.com/support/installer/articles/types-solar-energy

https://greenliving.lovetoknow.com/Why_Is_Solar_Energy_Important

Journal: "Potential of Solar Energy in India: A Review", National Conference on Renewable Energy and Environment (NCREE-2015)