

Solar Energy-the Brightest Way towards Sustainability

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Abstract

Any object or substance which we need our daily life because important for us. When an object or substance has economic or commercial value, it becomes a resource. Resources change the story of the development of a country.

The bountiful nature has provided various resources (in the form of matter, energy and space) that are of vital significance for the survival of all types of life including humans on the planet earth. In fact, all aspects of human society, such as social, cultural, economic, and political depend on natural resources. The resources are fundamental to the economic growth and development of human society. Unfortunately, with the rapidly increasing population and growing demand for resource consumption has resulted in the depletion of resources, environmental pollution and degradation.

Utility or usability is what makes an object or substance a resource. Things become resources only when they have a value. "Its use or utility gives it a value. All resources have some value." Anything beneficial and useful to man-kind becomes a resource.

Time and technology are two important factors that can change substances into resources. Both are related to the needs of the people. People themselves are the most important resource. It is their ideas, knowledge, inventions and discoveries that lead to the creation of more resources. Each discoveries or invention leads to many others. The discovery of fire led to the practice of cooking and other processes while the invention of the wheel ultimately resulted in development of newer modes of transport. The technology to create hydroelectricity has turned energy in fast flowing water into an important resource.

Keywords: Sustainability, environment, disaster, resources, renewability, photovoltaic, pollution

Introduction

This paper presents Solar Energy as the best substitute for conventional resources. Solar Power is becoming ubiquitous in the modern cities and even villages. Sustainable Development is possible only with executions of smart and sustainable form of energy i.e. Solar Energy. Solar Power is completely eco-friendly in nature. The use of Solar panels on roof tops has huge benefits. The panels also absorb hazardous radiations of mobile phone towers and transform them into electrical energy. Consequently, it reduces the harmful effects on human beings.

Because of the increasing demands in clean and environment friendly energy, the solar energy industry is one of the fastest growing sector in the market. When we talk about sustainable future, it is not possible without implementations of sustainable techniques. And here lies the importance of Solar Energy which is clean, infinite and free leads way towards safer and cleaner environment.

Sustainability refers to the judicious exploitation of resources to meet the future requirements without endangering their future availability. As Solar radiation is a form of flow or renewable resource which maintains its course naturally. It is abundant in nature and mankind need not care for their availability, thus Solar Power works for the cause of sustainability.

Solar Plants work through photo voltaic that call radiation and convert it into electrical energy. So, we can conclude that Solar Energy is the only choice that can satisfy the increasing demand of energy as well protect the environment

Resources

The following aspects of resources are of utmost concern to the present day society and future generations:

1. All natural resources are finite and have accumulated over a long period of time. Minerals and energy resources, in particular, are exhaustible resources; these have formed and accumulated over long geological time (millions of years). But these resources are being depleted at a very fast rate and are likely to be exhausted within a century or so.
2. The combustion of mineral fuels (fossil fuels) pollutes the atmosphere. The composition of atmosphere in terms of gases is altered and modified which affects the atmospheric processes. The concentration of carbon dioxide (CO₂) and other greenhouse gases has resulted in global warming. The depletion of ozone and the release of sulphur dioxide (SO₂) has resulted in acid rains.
3. Extraction of minerals creates pits and scars on the earth's surface and this leads to the destruction of biotic community. Excessive withdrawal of ground water results in the formation of large cavities beneath of earth's surface which ultimately cause surface collapse and subsidence. The disposal of waste materials into water and soil pollutes them which proves hazardous to human society as well as other organisms.
4. Faulty agricultural practices have induced the problems of soil erosion and depletion.
5. The introduction of new substances into natural ecosystems creates serious environmental problems.

- The new substances are continuously being introduced into air, water and soils. The most dangerous one is radioactive substances spewed into the atmosphere by nuclear explosion. These substances are circulated into air, water, soils, plants and further into food chains and food webs and prove lethal to all organisms including humans. Beside the radioactive substances, weedicides etc. used for agricultural purposes also adversely affect soils, surface and groundwater, and ultimately affect the food chains and organisms.
- Mishandling of resources and negligence in their use also affect the environment adversely. For example, the leakage of oil (petroleum) from oil tankers into sea water causes oil-slicks which rapidly spread over water and prove disastrous to marine life and human beings.

Natural Resources

All resources that occur naturally and have some values are known as Natural Resources.

There are many type of Natural Resources some of the are

- Level of development and use.
- Origin
- Renewability
- Distribution
- Stock

On the basis of Renewability we will discuss the resources –

Renewability

On the basis of Renewability, resources are divided into two types-

- Renewable Resources
- Non-Renewable Resources

Non-Renewable Resources

A non-renewable resource is a resource of economic value that cannot be readily replaced by natural means on a level equal to its consumption.

Most fossil fuels such as oil, natural gas and coal are considered non-renewable resources in that their use is not sustainable because their formation taken billions of years. These are resources which will get exempted after they will used.

Renewable Resources

- Renewable Resources which do not get exhausted even after continuous use. They get renewable and replenished quickly. Some of them are unlimited in nature and are not affected by human activities.

These sources of energy include are solar energy, Hydroelectricity energy, Wind energy, Tidal energy, Eco-thermal energy, Biomass etc.

- They are Renewable Resources are all free, green and emit no carbon dioxide. These are important because they all clear and constant alternatives to non-renewable such as oil, coal and natural gas:

Due to cost and technology, these resources have not been used to these full potential yet However, in the future the use of flow resources will increase due to technological Advancement and because non-renewable fossil fuels will decrease in availability.

Solar Energy

The sun is the source of light and heat. India is tapping solar energy for domestic purpose such as cooking and heating,

solar cells are combined in solar panels to generate power for heating and lighting purpose. Energy is released by sun as electromagnetic waves. India has the potential to develop solar power. Solar energy is also used in solar heaters, solar cookers, solar dryers and traffic signals. Solar energy is the most readily available source of energy. It is also the most important of the non-conventional sources of energy because it is non-polluting and, therefore, helps in reducing the global warming. India is ranked number one in terms of solar electricity production. The main solar energy production states are Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Telangana and Tamil Nadu.

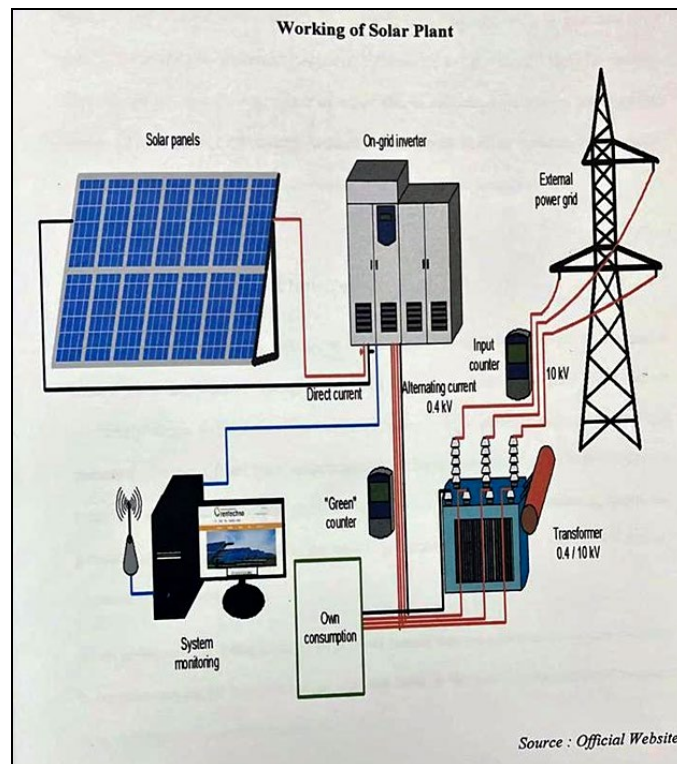


Fig 1: Working of Solar Plant

Solar Energy as Thermal

Solar thermal use the sun's energy to generate heat and electricity is generate from heat. This energy to generate low cost, environmentally friendly thermal energy. This energy is used to heat water as other fluids and can also power solar cooling system. These source of energy includes solar water heating system, Solar steam generating system etc. solar concentrators for process heat application etc.

Solar Energy as Photovoltaic

Solar photovoltaic (PV) is put on roof top of factories, Private & govt. institution Educational Institution, Hospital, School Building, Industries etc. It produce electricity from sunlight without moving parts. In a photovoltaic cell, Sunlight detaches electrons from their silicon atoms. Solar cells are packaged behind glass to form photovoltaic modules, photovoltaic modules situated on building roofs can produce as much electricity as the building consumes. The upper surface of the cell is known as a pn-junction.

Most photovoltaic cells consist of a semi-conductor pn junction, in which electron-hole pairs produced by the internal electric field in the junction to generate a current or a voltage at the device terminals.

Future of Environmentally Clear and Solar Energy

A type of solar power that used the sun's heat rather than its light to produce electricity. Although the technology for solar thermal has existed for more than two decades, project have languished while fossil fuel remained cheap.

Concentrating Solar Technologies

- Parabolic trough technologies
- Central receiver (tower) Systems
- Dish System
- Concentrating photovoltaic system(CPV)

Advantages of Solar Power

- a) The major advantage of solar power is that no pollution is created in the process of generating electricity. Environmentally it is the most clean and green energy. Solar energy is clean, renewable and sustainable helping to protect our environment.
- b) Solar energy does not require any fuel.
- c) It does not pollute our air by releasing Co₂, No₂ into atmosphere like many traditional form of electrical generation does.
- d) There is no going cost for the power it generates as solar radiation is free everywhere once installed, there are no receiving cost.
- e) It offers much more self reliance than depending upon a power utility for all electricity.
- f) It is quite economical in long run after the initial investment has been recovered, the energy from the sun is practically free. Solar energy system are virtually maintenance free and will last for decades.
- g) It's generated where it is needed. Therefore, large scale transmission cost is minimized.
- h) The use of Solar energy indirectly reduce health cost.
- i) Solar Energy support local job and wealth creation, fuelling local economies.
- j) They operate silently, have no moving parts, do not release offensive smells and do not require you to add any fuels.
- k) Solar energy can be utilized to offset utility-Supplied energy consumption It does not only reduce you electricity bill, but will also continue to supply your home business with electricity in the event of a power outage.

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