Solar uses lenses, mirrors or tracking systems

Environment, Global Warming

Solar energy is a very important renewable energy. Renewable energy is energy can get from renewable resources, which are replenished naturally after a certain period, like sunlight, wind, rain, tides, waves, and geothermal heat. Solar energy is a highly appealing source of electricity because of its huge magnitude.

Solar power is the transformation of solar energy into electricity . We can have solar power directly using photovoltaics or indirectly using concentrated solar power , or a combination of the both. A photovoltaic cell is a device that converts light into electricity using the photovoltaic effect. Photovoltaics gets its name from the process of transforming the light to electricity, which is called the PV effect in abbreviation.

The sun emits photons, which generate electricity when a photovoltaic cell is striked by them. In the same way a photovoltaic cell, made from a semi-conducting material, is a device that converts light into electricity. Solar cells are made of two or more thin layers of semi conductor materials, like silicon. The layers are of opposite charges ; positive & negative. When the solar cells are striked by sunlight , the electrons become free and move toward the front surface of the solar cell. Thus an electron imbalance between the front and back of the cell and electricity starts to flow. The flow of electricity depends on the intensity of light.

Concentrated solar power system uses lenses, mirrors or tracking systems to focus a large area of sunlight into a small beam. There are many concentrating technologies such as the parabolic trough, the compact linear Fresnel reflector and the solar power tower. Different techniques are used to

track the sun and focus light. A working fluid is heated by the concentrated sunlight to generate power and energy storage in all the systems. The parabolic trough consists of a linear parabolic reflector that concentrates light onto a receiver positioned along the reflector’s focal line. The receiver is a tube positioned along the focal points of the linear parabolic mirror and is filled with a working fluid. The reflector is made to follow the sun during daylight hours by tracking along a single axis. Parabolic trough systems provide the best land-use factor of any solar technology.

The SEGS plants in California and Nevada Solar One can be the examples. Compact Linear Fresnel Reflectors are CSP-plants which use many thin mirror strips instead of parabolic mirrors to concentrate sunlight onto two tubes with working fluid. This has the advantage that flat mirrors can be used which are much cheaper than parabolic mirrors, and that more reflectors can be placed in the same amount of space, allowing more of the available sunlight to be used. Concentrating linear fresnel reflectors can be used in either large or more compact plants.

A solar power tower uses an array of tracking reflectors to concentrate light on a central receiver atop a tower. Power towers can achieve higher efficiency than linear tracking CSP schemes and better energy storage capability than dish stirling technologies. The PS10 solar Power Plant and PS20 solar power plant are examples of this technology. A hybrid system combines PV and CSP with one another or with other forms of generation such as diesel, wind and biogas.

The combined form of generation may enable the system to modulate power output as a function of demand or at least reduce the fluctuating nature of solar power and the consumption of non renewable fuel. Hybrid systems are most often found on islands. A project of The International Energy Agency informs us that by 2050, solar photovoltaics and concentrated solar power would contribute respectively about 16 and 11 percent of the worldwide electricity consumption, and solar would be the world’s largest source of electricity.

In 2000 The United Nations Development Programme (UNDP) found the annual potential of solar energy 1500–49000 EJ. This is many times larger than the total energy consumption of the world, as we used 560 EJ energy in total in 2012. The Sun emits a tremendous amount of energy, in the form of electromagnetic radiation into space. At Earth’s distance from the Sun, about 1368 watts of power fall on an area of one square meter.

A survey tells that solar power provides just 1% of total worldwide electricity production currently. However the good news is that the production is increasing at 33% per year. Everyday the demand of energy is increasing, the source of non-renewable energy is decreasing, but we are still unable to utilize the 100% of renewable energy. Hopefully near future will help us to find a way to utilize the renewable energy to reduce the use of non-renewable energy like fossil fuel, petroleum oil and natural gas. The use of solar power will reduce pollution and will solve the problem of global warming as well. Above all , the proper use of solar power will increase the energy security of the world for the coming generations.