

Chapter 2

Solar energy

Renewable energy, is the energy generated from natural resources, which renews ~~them-self~~ itself ~~automatically~~. However, all renewable energies; ~~(aside from other than~~ geothermal and tidal); derive their energy from the sun. Around the world, engineers are ~~diving heavily in developing~~ working hard to develop technologies to ~~tape the into the~~ clean power ~~from of~~ renewable-energy ~~resources because of due to~~ their enormous potential to produce huge quantities of energy without generating greenhouse gases ~~and or~~ any kind of pollutants, which can negatively contribute to climate change. ~~We have~~ There are a wide range of renewable sources. ~~They have available with~~ great possibilities for improving our ~~the~~ future, if only we can learn how to best use them to our advantage ~~perspective~~.

~~During the millions of years that passed, the dead plants and animals slowly decomposed and became buried under layers and layers of mud, rock, sand and turn into organic materials and formed fossil fuels. That plant and animals originally used the energy of sunlight to grow; therefore, it is the sun's energy which is stored in chemical form, in fossil fuels.~~

~~Solar energy stored in the form of fossil fuels was probably first time used some 9000 years ago oil for lighting. Since the mode of use is nonrenewable, fossil energy is not usually encompassed in the range of renewable-energy forms. The photovoltaic (PV) effect was discovered by, Becquerel in 1839, but solar cell applications could not gain considerably momentum until 1954, when the Bell Laboratories developed successful photovoltaic panels in response to the space program demands, that given propitious for the use of photovoltaic panels~~ [8].

~~As well known, renewable~~ Renewable energy is created by the biggest and strongest natural source available to us, which is the sun, SUN, It is then it is transformed into ~~the~~ various forms of energy; (e.g. Ssolar radiation into wind or wave energy) and spread over the ~~earth~~ Earth's atmosphere ~~system~~ with the help of several complex processes. These processes are essential for the general circulation occurring in the atmosphere and in the oceans. The energy system experienced by the inhabitants of the ~~earth~~ Earth is dominated by the environmental heat

Commented [J1]: You used this paragraph in chapter 1. You can't use the exact same paragraph twice. I think this paragraph should stay in the introduction, and you should remove it from this section. Just delete it.

Commented [J2]: You used this one too. Almost identical. This paragraph should probably stay in this section, and you should remove it from the introduction. My recommendation is to take the edited version from the intro and put it here.

associated with the greenhouse effect, which captures solar energy and stores it within ~~a surface of the sheet~~the upper sheets of topsoil and in the atmosphere around the ~~earth~~Earth.

At present, the sun radiates energy at the rate of $3.9 \times 10^{26} \text{ W}$ ~~and~~ at the top of the ~~earth~~Earth's atmosphere, at an average power of 1353 W/m^2 , which ~~is passing~~passes through a plane perpendicular to the direction of the sun. Only 0.02% of this energy is currently ~~harnessed~~managed by humans. ~~Within this economically managed part of the sector,~~Meanwhile, renewable-energy sources ~~meanwhile~~ provide about 25% of the energy ~~sector~~we use. However, a large part of this renewable energy ~~is coming~~is derived from biomass, firewood (as used for cooking and heating in poor developing countries), ~~also and the burning of~~ residue and agriculture waste ~~is burning in~~ combined power and heating plants. The ~~other~~ sources of renewable energy which ~~are now into main future hopes for humans~~show the most promise for the future are wind, solar and hydroelectric power.

~~We get most of~~As previously mentioned, most of our energy comes from the sun, and it is ~~called~~ it solar energy. This energy ~~it~~ travels from the sun to the ~~earth~~Earth in the form of rays. The ~~S~~Sun radiates huge amounts of energy every day, and most of ~~the part of~~ that energy ~~goes off into~~is lost in space, ~~as~~ Only a small part ~~of that~~ reaches the ~~earth~~Earth. Sunlight turns into heat when it hits any surface. Solar energy circulation is a combination of many elements and internal processes. ~~If, we look at figure~~Figure 2.1, ~~we come to know that~~demonstrates how diverse and important ~~is the that~~ process can be for us. ~~It involves mainly~~It requires three main three processes to transfer energy from the sun to the Earth: reflection, absorption and conduction ~~to transfer energy from one to other~~. ~~A big portion of~~A large portion of the total incoming solar energy is absorbed by the land and ocean, ~~to which~~ provides the necessary energy ~~to~~ creatures require for survival by direct or indirect means. Another ~~big~~large portion is radiated ~~back into~~ space through the clouds and the atmosphere. A small ~~portion~~amount of this light energy is absorbed by the atmosphere to make the temperatures propitious for life on ~~earth~~for lifeEarth. ~~So, Therefore, W~~without the sun, we could not live on the ~~earth~~Earth, because ~~it would be too cold~~the freezing temperatures would make it uninhabitable. ~~We know this for a long time~~ solarSolar energy has the enormous potential as a clean, abundant, and economical energy source, but ~~cannot be employed as such as it has to be~~ it can be difficult to put that energy to use. ~~It must be captured and converted into useful forms of energy.~~ First it must be captured and

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Commented [J4]: This figure is good, it is useful. It helps to break down a complicated process for easier understanding. But I would add the figure in right after this sentence, and before the next sentence. The sentence that begins with 'It requires three main processes' can start your next paragraph underneath the figure. It just seems to be in a weird spot in the middle of your bullet points.

Commented [J5]: Earth is usually capitalized, as it is the proper name of our planet, like Mars or Venus or Jupiter. Earth is not capitalized when you use it to mean soil as in 'He dug in the earth.'

converted, and Ssince solar energy is diffuse and intermittent, conversion should-must involve concentration and reliable storage [9].

We can transform this upcoming-incoming solar energy into other kinds of useful energy:;

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- Solar thermal: Upcoming-Incoming sunlight can be used directly for the heating of buildings and water, and also indirectly for inner space heating through windows.
- Solar photovoltaic: Converting sun radiation into electricity.
- Solar biomass: by-uUsing trees and plants, wooden blocks, anaerobic bacteria, algae, agriculture waste or oilseed to make energy fuels, biogas, methanol etc.
- Food: All plants and vegetation grow by-the-with the help of energy from the sun and which is stored # in their roots and leaves. That energy feeds every living thing on earthEarth in different-a variety of ways [11].