Solar energy in production and nature

Business, Industries

ABSTRACT The assignment is based on solar energy and the title is “ Solar Energy: and infinite resource meeting our infinite demand. ” Firstly, solar energy is then introduced where it states that the energy radiated from sun is the solar energy which is essential for Earth. The aspects to be covered and themotivationfor choosing solar energy are then explained. Pictures of solar cells are provided to have a better view of how solar power is generated.

In addition, the importance of solar power is explained which says that solar energy is important to nature as it is the power source of life and a clean energy as it helps to keep theenvironmentgreen. Secondly, the process of generating solar power from solar energy is explained with the help of a diagram. Next, real life examples of how solar power is harnessed in different countries are given. The examples are described in details and the use of solar power in Germany and Bangladesh is highlighted. Then, a table is included which represents the largest photovoltaic power stations around the world.

After that, some plans of using solar power in future are given in details. It further talks about the future of solar power in Bangladesh and India. Finally, the assignment is concluded with the thought that solar energy is a renewable resource which when used causes nopollutionand for this reason, the world is watching that solar energy is not only capable of saving electricity but also it has many offerings that goes beyond what most people think. Solar Energy: An infinite resource meeting our infinite demand

Introduction Sun had been the main source of energy since the Earth was born.

It is the source for primary production. People have been using the energy of Sun in various ways. Apart from these usages, people have finally learnt to generate Solar Power from the solar energy. The Sun is 150 kilometers away, and amazingly powerful. Just the tiny fraction of the Sun’s energy that hits the Earth (around a hundredth of a millionth of a percent) is enough to meet our power needs many times over. In fact, every minute, enough energy arrives at the Earth’s surface to meet our demands for a whole year – it the energy could be harnessed properly.

That is, Solar Energy is an infinite resource meeting our infinite demand. The sun produces a tremendous amount of energy. Every second, more than 4 million metric tons of hydrogen is converted into helium. But even at this rate, the sun will continue producing solar energy for another 5 billion years. As a result, solar energy is considered the ultimate renewable energy. Aspect to be covered: The use of solar energy to generate solar power (solar cells) and save electricity. Motivation: Nowadays, non-renewable resources are at crisis. In Bangladesh, electricity consumption is high and it fails to meet the demand.

Bangladesh suffers load shedding at a high rate. Therefore, in order to save electricity, people must come forward and learn to harness solar energy in order to produce solar power. The more efficiently the solar energy can be harnessed, the more electricity can be saved. Using solar energy we will be able to reduce our carbon footprint and be free from rising utility rates. Importance of Solar Energy Generating Solar Power involves no pollution.

Environmentally, it is the most Clean and Green energy. Solar energy is clean, renewable (unlike gas, oil, and coal), and sustainable, helping to protect our environment.

Solar Energy Is Important In Nature: Solar energy is an important part of almost every life process, if not, all life processes. Plants and animals, alike, use solar energy to produce important nutrients in their cells. Plants use the energy to produce the green chlorophyll that they need to survive, while humans use the sun rays to produce vitamin D in their bodies. However, when man learned to actually convert solar energy into usable energy, it became even more important. Solar Energy Is Important As Clean Energy: Since solar energy is completely natural, it is considered a clean energy source.

It does not disrupt the environment or create a threat to Eco-systems the way oil and some other energy sources might. It does not cause greenhouse gases, air orwater pollution. The small amount of impact it does have on the environment is usually from the chemicals and solvents that are used during the manufacture of the photovoltaic cells that are needed to convert the sun's energy into electricity. This is a small problem compared to the huge impact that one oil spill can have on the environment. The Conversion of Solar Energy to Solar Power

Solar Cells (also called “ Photovoltaic”, “ PV”, or “ Photoelectric” cells) convert sunlight into electricity. It is made up of three subsystems * The PV Devices generate the solar power by converting sunlight into direct-current (DC) electricity. * The BOS consists of all the equipment between the PV devices and the load. It includes the structure for mounting the PV devices,

he power conditioning equipment to convert the DC electricity to alternating current (AC) for the use by the load, and batteries for storing the PV generated electricity if desired. The Load is simply the device that uses the electricity. The television is a good example of a load. Case Studies: * Germany has long been the world leader in producing solar electricity Some people believe that Germany’s walk away from nuclear power will lead it down to more fossil fuel plants own and all the CO2 emissions that come with them. But the country was cranking solar electricity like it or no nation ever has, according to the International Economic Platform for Renewable Energies in Muenster.

The group said in a press release last Saturday that photovoltaic operations in Germany were producing at 22 gigawatts for a cloudless stretch beginning at around noon on Friday, May 25, 2012. As the institute pointed out, that was the equivalent of about 20 nuclear power plants. Germany has long been the world leader in producing solar electricity, in large measure because over a decade ago it implemented “ feed in tariffs” (FiTs) that essentially pay people and businesses for generating solar. Germany has been cutting those tariffs steadily, and at an accelerating pace as plunging prices of solar panels makes them less necessary.

The FiTs have encouraged solar uptake and have led to lower prices through manufacturing economies of scale. On top of that, Chinese manufacturers have pushed prices down. German’s Parliament recently sped up FiT cuts in part because the subsidy has led to higher electricity prices, a Bloomberg Businessweek story noted two months ago. The importance of solar is now greater than ever in Germany, following the country’s decision to abandon

nuclear power after Japan’s Fukushima nuclear meltdown in March 2011. The world is watching this one. * Exploration of Solar Power In Bangladesh

Bangladesh is a massively power-deficient country with peak power shortages of around 25%. More than 60% of its people do not have access to the power grid. The country only produces 3500-4200 MW of electricity against a daily demand for 4000-5200 MW on average, according to official estimates. Solar energy is an ideal solution as it can provide grid less power and is totally clean in terms of pollution andhealthhazards. Since it savesmoneyon constructing electricity transmission lines, it’s economical as well. Little wonder that it is becoming popular in Bangladesh.

The number of households using solar panels has now crossed the one million mark, the fastest expansion of solar use anywhere in the world. In 2002, just 7, 000 households in Bangladesh were using solar panels, but now more than one million households, or five million people, are benefitting from solar energy. The Government of Bangladesh has also withdrawn all the import tariff and VAT (Value Added Tax) on the raw materials of solar panels for the current fiscal year. In his budget speech, theFinanceMinister Abul Mal Abdul Muhit said that Bangladesh gets about 250 to 300 sunny days on average per year (rainy days are not included).

He added that since the maintenance cost is very low, we could massively increase the use of solar power in the country. The solar panel providers in Bangladesh are now expecting the price of batteries and accessories to drastically reduce. In fact, solar panels and accessories imported from countries in the developed world like Germany cost a lot, but the same panels manufactured in China cost much less. In the capital city, Dhaka, the

power department has set a pre-condition of installing solar panels on buildings applying for new connections.

In the villages, solar power is even being used to operate pumps for irrigation. Today both urban city dwellers and villagers in remote areas of Bangladesh are using solar energy. PhotoVoltaic Power Stations World's largest photovoltaic power stations (50 MW or larger)| PV power station| Country| DC peak power (MW)| Notes| Agua Caliente Solar Project| USA| over 200| 397 MW when complete| Charanka Solar Park| India| 214| Completed 2012| Golmud Solar Park| China| 200| Completed 2011| Sarnia Photovoltaic Power Plant| Canada| 97[24]| Constructed 2009–2010| Montalto di Castro Photovoltaic Power Station| Italy| 84. | Constructed 2009–2010| Finsterwalde Solar Park| Germany| 80. 7| Phase I completed 2009, phase II and III 2010| Okhotnykovo Solar Park| Ukraine| 80| Completed 2011| Solarpark Senftenberg| Germany| 78| Phase II and III completed 2011, another 70 MW phase planned| Lieberose Photovoltaic Park | Germany| 71. 8| | Rovigo Photovoltaic Power Plant| Italy| 70| Completed November 2010| Olmedilla Photovoltaic Park| Spain| 60| Completed September 2008| Strasskirchen Solar Park| Germany| 54| | Puertollano Photovoltaic Park| Spain| 50| opened 2008| Possible future projections and recommendations: In Bangladesh, Gazipur Solar Panel Plant will be initiating soon BANECO Solar Energy Ltd. , a German-Bangladesh joint-venture, will start manufacturing European standard solar panel in the country very soon. The company has already set up a manufacturing plant at Gazipur at a cost of Tk. 27. 27 crore in effort to reduce country’s dependence on import of Solar Panel. In addition, BANECO has a plan to manufacture solar power station in each district, solar irrigation

pump and solar streetlight gradually. * Powering Streetlights in Dhaka with Solar Power

Currently, Dhaka uses around 22, 000 sodium lights and 57, 000 fluorescent lights for its streetlights. Plans are afoot to have solar-powered lights at 100 traffic intersections under a separate project funded by the World Bank. The solar panels will also power automatic time-countdown displays at intersections to tell motorists when the next change of lights will be. The power demands of traffic lights are insignificant, but officials said the project will raise awareness among the motorists about greentechnology. * Planning 1000 MW Solar Power Plant in Gujarat, India

Taking cue from Gujarat, Damodar Valley Corporation (DVC) proposes to set up solar power plant atop 2, 494 kilometers long network of canals that has the potential to generate up to 1, 000 mw green solar power. Setting up solar power plant atop water canal eliminates the need for land acquisition and water evaporation from the canal that is quite high in India with sunshine for nearly 300 days in a year. Future of Solar Power: The future of solar PV looks rather bright. The industry has consistently been able to lower the cost of solar panels.

If this trend can be maintained for the next 10 years, and if subsidies are continued for that period, there is a real prospect for solar to become cost competitive on its own (that is, without a subsidy), at least for commercial installations. Utility-scale installations will take longer to become competitive. Conclusion Solar energy is lauded as an inexhaustible fuel source that is pollution and often noise free. The technology is also versatile. For example, solar cells generate energy for far-out places like satellites in

Earth orbit and cabins deep in the Rocky Mountains as easily as they can power downtown buildings and futuristic cars.

Today's solar product offerings go way beyond what most people think of when they hear the term 'solar power' or 'solar energy' – typically they imagine solar electric panels on a roof converting sunlight into electricity. While these 'photo voltaic' panels do represent a piece of the solar pie, many more solar-powered products and technologies utilizing the sun's energy now exist. Solar PV systems, battery-backed off-grid systems, solar farms and more are at the forefront of the solar power world innovations, with more to come. References http://environment. nationalgeographic. om/environment/global-warming/solar-power-profile/ http://www. solar-energy-at-home. com/why-use-solar-energy. html http://www. darvill. clara. net/altenerg/solar. htm http://www. smartplanet. com/blog/intelligent-energy/solar-electricity-world-record-germany-cranks-half-its-power-with-pv/16354 http://www. reuters. com/article/2012/07/05/us-bangladesh-solar-idUSBRE8640DM20120705 http://www. energybangla. com/ http://cdkn. org/2011/07/explosion-of-solar-power-in-bangladesh/ http://www. mydigitalfc. com/news/dvc-plans-1000-mw-solar-power-plant-over-water-canal-network-586