

Good example of essay on solar power

[Environment](#), [Electricity](#)



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Abstract

The project deals with the problem of solar power that is an environmentally safe alternative to the currently used sources of energy, such as oil, gas and coal. It is proved that renewability, an ecological safety and a relatively constant availability of this energy sources are the main advantages of solar power. However, technological expensiveness of energy retrieving appliances, especially in the case of space-based solar power, is cited as one of the main disadvantage that prevents the USA from putting solar energy to a good use unlike Germany where state dotation and solar program flexibility allow the unrestrained installation of solar panels. The research also highlights the main options of solar energy application, such as photovoltaic systems, solar electricity, solar hot water, solar process space heating and cooling, and passive solar heating. Additional focus is put on solar power operation and solar panels composition.

Keywords: solar, power, energy, application, panel, warming, photovoltaic, electricity

Now that anthropogenic-activity-induced global warming has reached its highest, threatening to inflict an irreparable damage, humankind are starting

to work on putting a stop to its major stimuli. To this end, scientist attempt to tackle the problem of environmentally hazardous nonrenewable fuels as contributors to the greenhouse effect. Either that or researchers are making efforts to handle resources depletion, since the non-renewables are exhaustible. However, as such they have safe renewable alternatives in the energy of wind, rain, tides, and most importantly, sun. If harnessed skillfully, sunlight is sure to open new vistas for human race that used to be critically dependent on conventional sources of energy, such as oil, gas and coal. According to Philibert (2005, p. 2), not only does the radiative energy that the Sun produces to maintain planetary warmth excel current energy suppliers applied for leisure, comfort, and economic activities, but it also surpasses such ground level sources as tidal or geothermic energy, fossil fuel burning, and nuclear power. It is well-documented that sunrays are capable of driving hydraulics, wave and wind power, and biomass growth. Sunlight energetic potential is about 8, 000 times that of traditional surface sources. Faninger (n. d., p. 1) claims that, whether in low or medium temperature zones, cold or hot climates, inexhaustible and environmentally beneficial solar energy may be used for cooling and heating, process heating, and crop drying. Overall, solar heat alone has a potential of covering the need for energy throughout Europe and the entire world almost completely. According to United States Environmental Protection Agency (2012), solar technologies subdivide into passive and active categories. Passive solar generates heat as well as provides lighting for structures. Active solar energy is tasked with generating electricity by using PV or Solar Photovoltaic technology or producing hot water, heat, or electricity by resorting to Solar

Thermal technology. One of the most widespread and familiar to people, the Solar Photovoltaic technology is the safest and the most user-friendly of solar technologies that requires no extra installation efforts. Electrical properties of semiconductors are used for generating electricity. Once hit by a sunray, a semiconductor produces an electrical charge transferrable through a circuit to whatever consumes electricity. Passive solar is said to use solar energy through the way the structure is designed, oriented, and constructed. In using passive solar design fewer or smaller-scale active technologies by building, people may meet the remainder of heating and lighting needs. Low prices for solar energy and the application of passive solar techniques can decrease energy costs significantly (United States Environmental Protection Agency, 2012).

According to Renewable Energy (n. d.), solar hot water technology is applied when building in the shape of solar water heating systems that contain of two parts, namely, storage tank and solar collector. There are active and passive water heating systems, active type is the more common of the two. Here, the liquid is moved by pumps between the collector and the storage tank. Passive systems, in turn, rely on gravity and water circulation nature by heating. Another benefit of sun energy application is solar electricity that is being put to a good use in plants of the new generation where sun heat causes water to boil and rotate a large turbine responsible for activating electricity-producing generator. Such solar power concentrating systems as power tower, dish/engine, and parabolic-trough facilities produce potent amounts of electricity out of solar energy. Finally, solar process space heating, cooling, and solar process preheating, while impractical for living

quarters, may be indispensable for nonresidential buildings. Large buildings need air ventilated in order to keep its indoor quality. Heating this air in a cold climate may require large amount of energy while solar ventilation mechanism will be genuine money and energy savers by preheating air. Scientists design solar process heating systems for supplying substantial amounts of hot water as well as space heating for commercial and industrial buildings. Solar collector heat may be used for cooling buildings. Unlike conventional air conditioners that consume large quantities of electricity to produce cool air, solar absorption coolers use solar energy with evaporative or “swamp coolers” in combination with desiccant cooling systems in order for them to function in humid climates (Renewable Energy, n. d.).

Different countries have different solar energy potential or degree, to which sun power may be harnessed. Plumer (2013) claims that Germany solar power exceeds 5 times that of the USA regardless of Alaska solar potential. Though receiving mediocre amounts of sunlight as compared to the USA, Germany has proved the world leader in solar power application. As much as 10% of overall electricity was generated by 30 gigawatts of solar capacity, as of 2012. America has mere 6, 4 gigawatts of sun power capacity. The only difference between two countries lies in governmental treatment of renewable sources through state programs. German state subsidized “feed-in tariffs” authorize people to install solar panels on rooftops as well as selling power to the grid at competitive price rates, with costs shared by electricity users. What is more, solar installations are twice as expensive in the USA as they are in Germany due to a smaller size of the industry. There is another important factor not to rule out by comparing solar potential of

both countries. The matter is that permission process is much easier in Germany where installers do not have to overspend on inspections, marketing, and grid-connection fees. Overall, it is not that the US have no chance of matching Germany solar potential, it is that it is up to governmental agencies to choose whether or not to bankroll solar and other sources of energy free of carbon (Plumer, 2013).

Solar energy may be harnessed not only on the Earth, but also in open space. Dvorsky (2012) opines that space-based solar power is needed, considering the rate at which fossil fuel supplies are running out and humankind's demand for energy is increasing. According to National Space Society (2013), space solar energy tends to emit zero greenhouse gases, as ethanol, oil, and coal plants do. This type of energy shows no signs of dependence on the scarce resources of fresh water. Space solar power no more competes for farmland than it depends on fertilizers derived from natural gas, which will help shift focus on food cultivation, partly solving current acute famine dilemma. There is no need for detrimental waste to be stockpiled and stored for years to come. The versatility of this energy is that it is available on a daily basis without a breach of continuity and irrespective of cloudiness, wind speed, and daylight. Space solar will whittle away competition for depleting natural resources, and make countries independent of profiteering oil providers. More importantly than that, there will be one less weak spot to be targeted by terrorists. Space solar energy may well be applied for local needs, more specifically, for manufacturing methanol to be used in rural areas of India that lack for power grids that produce electricity. Desalination of seawater is yet another option of solar

power application, which is priceless at current conjuncture (National Space Society, 2013).

Locke (2008) suggests that energy-rich sunlight power is converted into electrical current by colliding with specific surface. Classic solar technology takes advantage of large silicon crystals that generate that same electrical current during a light strike. Seeing that this technology is expensive, there was another approach called “ thin-film” solar technology elaborated by scientists, with far less expensive crystals, namely, copper-indium-gallium-selenide used in the process of shaping flexible films for generating and supplying solar energy; however, they do not appear as efficient. To be more specific about the process of energy generation, bonds between silicon atoms in a crystal are composed of electrons shared between all of the atoms. When the light is absorbed, one of the electrons becomes stimulated to higher energy levels and starts moving around the crystal far more loosely than it did prior to sunshine contact, which makes it possible to produce current (Locke, 2008).

As far as solar panels’ production is concerned, according to The Eco Experts (n. d.), these items are composed of solar cells that are produced from such semiconductors as monocrystalline silicon or polycrystalline silicon that display the above-mentioned photovoltaic effect. To gain power output rating of solar panel, solar cells are bound together. After the interconnected cells become protected with a weatherproof coating made of glass, the whole section is sealed in order to produce a solar photovoltaic panel. Connectors are adjusted for them to enable solar panels to be bound to

external devices and batteries as well as solar panel systems (The Eco Experts, n. d.).

Conclusions

Solar power is a technological breakthrough that has a potential of tackling the problem of global warming by means of ecologically safe solar energy source. Solar energy application comes in the form of photovoltaic systems, solar electricity, solar hot water, solar process space heating and cooling, and passive solar heating. Solar energy is a brand-new alternative source of power that has plenty of advantages, but one. It is environmentally safe since it does not emit hazardous carbon gases as well as being renewable; still, dependent on sunlight that is not available round the clock. It requires that residential space be equipped with energy storage systems. Space-based solar energy does not have any hindrances and is accessible anytime. The sobering reality is that solar energy is far more expensive than that produced from traditional fossil fuels is. To compare countries in terms of solar energy production, Germany seems to be surpassing the USA due to subsidies and the flexibility of state programs that allow citizens to use environmentally-friendly solar devices. In any case, it pays to have safe energy sources that are bound to go down in price with time.

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