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Persuasive Essay Draft

Solar Energy: The Simple Solution to a Huge Problem

In a world built on the cheapest, easiest conveniences of energy, a majority of American society seems blind to the other solutions available. It is no question that burning fossil fuel causes pollution, but we are entirely dependent on its use. We are long past our halfway point of using the earth's fossil fuel, and we are drilling into what optimists say is 40 years left of fossil fuel, though many experts guess much less. 40 years is very soon, and should we really suck the earth dry of fossil fuel? Fossil fuel leaves a huge impact on the environment. The United States interests always seem to be underlying with fossil fuel, and the price continues to rise. With the earth's population exceeding 7 billion people, how could we afford to use Non-Renewable Energy? Like a bad addiction, I believe the United States can break their habit of fossil fuel and be pro-active on obtaining something renewable, to care for our country.

Solar Energy takes the heat from the sun to make renewable energy. It's called Concentrating Solar Power (CSP). This takes the heat from the sun onto solar panel mirrors, creating heat that spins generator with heat that can be used multiple times. The southwest United States is the most ideal place to get solar power, and one solar power plant can generate 250 MW or more, which is enough to power 90,000 homes or more. This will be an investment, Solar energy was much more expensive 30 years ago than today, but will only continue to become

affordable with some investments. The sun is a readily available resource and puts off enough energy every hour to power the earth for a year. The amount of energy hitting the Earth is incredibly large, a month of sunshine has the equivalent energy of all the planet's used and unused fossil fuels.

Although the nature of solar energy has two disadvantages. First, the sun does not shine consistently throughout the day due to clouds and weather, which can be problem for constant electricity and heat. Also, solar energy cannot be used for nighttime production. However, energy can be stored from a sunny day and used for a rainy one. In Spain, they have used a combination of sodium and potassium nitrate that can store the sun's heat for 8 hours after the sun sets. . With mirrors you are able to concentrate the sun's power and use it for longer periods of time. Though long periods of overcast and clouds may run into problems. The other shortcoming is that the energy from the sun is a diffuse source, being that it falls over a wide area. In order to utilize this energy, it must be concentrated into a form and amount we can use, such as heat and electricity. These problems are addressed in the three steps used to harness the sun's energy collection, conversion, and storage.

Solar energy is used to heat water for homes and buildings. Solar heating water systems have an efficiency of less than 100%. This can be attributed to the percent of energy transmitted through the angle of incidence of light striking the collector, the number of glass sheets (one sheet has an efficiency of 95%), and the composition of the glass. Despite the less than 100% efficiency, a home using solar heated water rather than gas heating saves about 1200 pounds of pollution annually. All the solar hot-water systems in the United States save about 1,000 MWh of

energy, the equivalent of removing the emissions of two medium sized coal-burning power plants.

A passively heated home uses about the 60-75% of the solar energy hitting its walls and windows. The Center for Renewable Resources estimates that in almost any climate, a well-designed passive solar home can reduce energy bills by 75% with an added construction cost of only 5-10%. As seen before, low fossil fuel prices do not create a demand for a solar heating system. Proponents of fossil fuel heating argue that the sun cannot be relied on to heat water and living space at nighttime. The answer to this is to use traditional methods of heating at when the sun is unavailable. Considering that 25% of all energy consumed is used to heat water and living space, passive solar heating presents a realistic and cost effective option to decrease our dependence on fossil fuels, not to mention to decrease the amount of pollution released due to their consumption.

Electrical production falls under two categories: solar-thermal and direct conversion. One form of solar-thermal electrical production is a power tower. The idea of power tower plant is to collect the light from many solar reflectors spread over a flat, wide area of land at one central point high above the ground. The energy hitting the central receiver is concentrated, equivalent to thousands of suns hitting it. This concentrated energy heats a fluid that drives a steam turbine to produce electricity. Power tower plants also use the waste steam from the turbine for space heating and other industrial processes to decrease capital costs, but not enough to make them competitive with fossil fuel power plants. With technological improvements to increase efficiency and design, capital costs of power towers are expected to decline.

Parabolic dishes and troughs are the other forms of solar-thermal production. Unlike a

power tower, sunlight is focused on a smaller level to heat a liquid. With the dishes, each collector has its own central point. In a trough system, a pipe of liquid runs throughout the entire row of parabolic reflectors, which is heated by the reflectors. In both cases, the heated liquid becomes steam that drives a turbine to generate electricity. Since parabolic dishes and troughs work best under direct sunlight, collectors must be steered in the direction of the sun throughout the day. Because of their current costs, the predominant users of PV cells are rural residents and other customers far away from power lines. It is more economical for these customers and the power companies to install and maintain a PV cell system rather than extend power lines to reach the customers. PV cells can be used to generate electricity on a large scale.

The biggest challenge solar energy is facing is the economy. Though the switch will make a renewable resource which in time will become cheaper than fossil fuel, the startup costs and extra money is hard for people to manage. We are not putting enough money into the startup of renewable energy. Though we are in an economic recession, this is something that over time will only help an economic recession and our countries interests. The United States is not at a point where competitive rates for solar power, or any renewable energy resource, are accessible to the entire country. In a state like California, it is something much more accessible. According to NPR, multiple Solar Power companies have gone under in 2011. The subsidized rates of China's solar panels is not something that companies in the United States can compete with, bringing up a separate problem completely. So although it is not self sustainable, this technology is readily available at a cheaper rate from China.

Solar power is becoming more affordable though, last year solar modules were selling for

1.70 a watt and now are down to .90 a watt. This means that investors believe they can build solar power plants, sell it for affordable rates, and still make money. The technology has become more affordable and solar power does not have to be very expensive it just has to be invested in. We should see this readily available within the next ten years. There are also tax incentives for people who chose to use renewable energy on both the federal and state level. In California, there are more incentives than anywhere else. The city of San Francisco released an annual report highlighting the growth of renewable energy from 1991 to 2011 and it shows that more money and resources have been put into renewable (mostly solar) energy than ever. San Francisco is working towards having half of their city powered by renewable energy.

Solar energy is a resource that must be utilized. The argument that the solar energy is only dependable during the day is countered by the fact that 70% of all energy demands are during the day. During the night, traditional methods of power production can be used if you are unable to store them. Though I would argue that ways have been found to store that energy effectively. Currently, about three quarters of electrical power is produced from coal burning and nuclear power plants. The goal is to decrease our dependence on fossil fuels, which their consumption directly and indirectly pollutes the air, water, and ground. Harnessing solar energy mitigates the harmful effects of burning fossil fuels (acid rain and global warming) and does not have the risks associated with nuclear energy. Undoubtedly, solar energy will become more important as our fossil fuel reserves shrink and the negative impacts of fossil fuels are fully realized. Though we can ignore an issue such as this, it will inevitably catch up with the world. It is important the the United States has a cohesive plan to stop our dependency on fossil fuel, which with a few years of

investments, could easily be Solar Power.

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