

Abstract

Our middle school has written a TEAMS research paper about finding the best renewable energy source that can power Indiana for the next five years. After extensive research on other possible energy sources, we concluded that solar power would be the best fit. In order to prove our findings, we included information gathered from many scholarly sources and research over solar energy. Furthermore, to develop our case we have included a practical problem, and many solutions to enhance this problem. Also, we approximated the calculation for the cost of our implemented solutions. As a team we created a paper that may provide the key towards a brighter future.

With the escalating population, drawbacks with energy usage are becoming common. At this rate, if something isn't done, the world will run out of its nonrenewable resources. To solve this problem, scientists have been researching the possible alternatives of renewable energy sources for decades. Our group was asked to identify the best option for supporting Indiana's energy usage for the next five years. After researching the possibilities of varying renewable energy sources, we concluded that solar energy was the best fit because of its dependability, accessible efficiency, and environmental friendliness. Regardless of its flaws, there are many possible solutions to make solar energy the main energy source for Indiana.

Solar energy is the most dependable renewable energy source in Indiana because of its efficient access and environmental friendliness. *Currentresults.com* states that, the major cities in Indiana are sunny for over 50% of the year which is a sufficient amount of sun to power homes (N.a. N.d.). Theoretically, this means that Indiana has the potential to power on solar energy for five years or more, making solar power a great implement towards Indiana's future. Another reason why solar energy is best for Indiana is because it is very "green". In fact, the U.S is already trying to make the switch towards solar energy. The U.S. is the fourth leading country using solar energy right behind others like China and Japan. Furthermore as "Vote Solar", a group that promotes the use of solar energy, states, "When there's a huge solar energy spill, it's just called a nice day" (Hudgens 2011). Although solar energy seems to be the best fit, there are flaws. Current solar panels are stationary and therefore can only harness and create energy from the sun when facing it. This causes the panels to be unreliable because the solar panels can not be

trusted to make power 24/7 if the sun is positioned where the panel cannot receive light.

Nevertheless, there are solutions to these problems. In fact, it is possible to manufacture solar panels that rotate everyday to the predicted direction of the sun. In regards to a substantial cost increase, these rotating solar panels would harness more power than regular panels. Moreover, to make solar panels more reliable, people can create solar panels that transfer all excess energy into batteries. This is beneficial, so that when it is dark or cloudy, people can use the charged batteries to power their homes. According to “Three Clever New Ways to Store Solar Energy” by *PopularMechanic.com*, there are already solar panels that put excess energy into batteries (Krisch 2014). In addition, there are even studies being done to allow scientists to create solar panels that can collect energy from moonlight. The ability to harness “lunar power” will further open up the possibilities for solar technology and strengthen the idea that solar power is the best renewable energy source for Indiana.

After understanding how to make solar panels more efficient, it was important to calculate the cost of these implemented solutions. In order to calculate this cost, first it was necessary to approximate the watt hours used per person per year, which is around 129 million. After finding Indiana’s average energy consumption of 85.8 billion kilowatt hours annually, it was essential to find a similar solar panel already in existence that could perform similar tasks to the solution. It turns out that the Rawlemon Spherical Sun power generator in London, England was very similar to our solution. Although still in its developmental stages, this generator used a

spherical glass ball to harness sunlight from all angles and focus the rays of light onto one small area. By focusing the power into one area, it was more efficiently harnessing the sun's rays.

According to *newatlas.com*, a website working towards providing up-to-date information about the rise of technology claims that the "Beta.ray 1.0 will generate up to 1.1 kWh a day [and] it has a 1.8 kWh battery" (Robarts 2014). These panels can harness moonlight, are weather resistant, and more durable. Calculations show that an individual could run on 100% solar power for the length of his/her lifetime by using the Rawlemon generator for approximately \$97,210. These solar panels will pay themselves off in about 30 years from a lack of electric bills and a 5% investment of the annual average income of an Indiana resident. In order for renewable energy to be successful, it must be clean, accessible, and affordable. This makes solar power a perfect solution for Indiana's energy usage.

After research, our team determined that solar energy would be the best choice for the state of Indiana. With our new implemented improvements on solar energy, not only will it be efficient and clean, but it is very accessible and durable. Solar energy also creates a very reasonable amount of energy with its solar tracker, lunar power, and battery storage, compared to the other renewable energy sources. With the usage of solar power, the whole world could have a much brighter future.

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