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Solar, why not?

Emily Hergenrader
University of Nebraska-Lincoln, ehergenrader5@gmail.com

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Imagine yourself standing outside for an hour wearing a black shirt on a 90-degree day. Now touch your shirt. Notice how warm it is? This warming is due to the sun's energy. According to Daniel Nocera, a member of the Division of Chemistry at the Massachusetts Institute of Technology, that same heat from one hour of sun exposure is more energy than all of the energy consumed by humans in an entire year.

Energy is one of the hottest topics debated in our world today. Human existence on Earth depends on energy usage and the availability of its consumption. Due to our unhealthy addiction to non-renewable sources of energy, we are not only degrading our environment, but we are also jeopardizing mankind's health now, and for the future.

Currently, we burn harmful fossil fuels to produce energy. If this burning continues at the current rate, Carbon Dioxide levels will continue to rise to levels of 1500 ppm. If 1500 ppm of Carbon Dioxide in our atmosphere is reached, the atmosphere will not return to pre-industrial levels for tens of thousands of years into the future. Although there are natural sources that emit this gas including ocean release, respiration, and the process of decomposition, human action has upset the overall natural balance of the carbon cycle. Human produced Carbon Dioxide in the atmosphere has increased by 90% since 1970, which is already starting to show effects in our typical weather patterns, overall plant growth, and sea levels. Human created Carbon Dioxide comes from activities such as cement production and deforestation, but most importantly, from the process of burning nonrenewable resources such as fossil fuels like coal, oil and natural gas.

Coal and natural gas are primarily used to generate electricity. According to EESI, the Environmental and Energy Study Institute, coal alone is responsible for 39 percent of the electric power supply in the United States in 2014. Natural gas on the other hand comprised 27 percent of the U.S. energy use in 2014. Oil, on the other hand, requires extraction technologies that include energy intensive methods that result in more emissions and environmental degradation.

Scientists, engineers, and environmentalists around the world are working diligently to tackle this energy issue. Solar power is one of the most affordable, accessible, and prevalent sources of energy in the United States today. Since 2008, U.S. installations of solar panels have increased exponentially at a rate where we can now power the equivalent of 5.7 million average American homes solely on renewables. Since 2010, the average cost of solar PV panels has dropped more than 60%, making it more accessible and affordable for Americans to install solar panels for their own use. This allows Americans to be able to take this issue into their own hands.

Markets for solar energy are maturing at a rate that is now competitive with conventional, nonrenewable energy sources in California, Hawaii, Texas and Minnesota. As the cleanest domestic energy source available, solar supports broader national priorities including climate change mitigation, job creation, and our national security. If we cover just 0.6% of

our land with solar panels, we could supply enough electricity to power the entire United States.

Although solar energy provides significant environmental benefits in comparison to non-renewable energy sources, even solar energy has negative effects. Solar's wide scale deployment has been linked to negative environmental implications as well. One concern regarding large-scale implementation of solar energy is its need for significant land use. The facilities needed for solar gathering and generating equipment has been linked to compromising natural habitats which has created a challenge to the traditional model of utility-scale solar energy installations.

Although affordability is increasing with solar panels, there is still significant work that needs be done before solar becomes as affordable as conventional energy for all states in the United States. Although solar hardware costs have declined, market barriers, grid integration, and cost-effective storage challenges continue to hinder a more widespread development.

Innovations to lower cost and increase storage in solar technology have become the main focus in the industry. Battery storage, Thermal Storage, and Photovoltaic Storage are three current storage options. Unfortunately, all fossil-based energy remains more cost-effective compared to renewable energy. Coal costs $0.095-0.15 per KW-hr, natural gas costs $0.07-0.14, compared to solar costs of $0.125-0.24 per KW-hr. Even though current technologies remain more expensive, scientists remain optimistic about the future of solar energy.

We have a significant amount of work to do to create an energy system based upon non-renewable resources. Although, for the sake of our generation as well as future generations, we must understand that it is our responsibility to advance to alternative, renewable power sources. Solar energy is a step in the right direction to accomplish this goal.

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Story by Emily Hergenrader
Junior at University of Nebraska Lincoln
Environmental Studies Major: Natural Resources Emphasis with a minor in Agricultural Environmental Sciences Communication
Ehergenrader5@gmail.com
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