Wind Energy for a Healthier Future

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Reprinted 2015

By ***Aquosus Potentia***

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Outline

I. Introduction
   A. Using wind energy for electricity could stop harmful toxins from polluting the air, thus making it healthier to breathe.
   B. Wind power has been used for centuries for many things like grinding mill, pumping water, and finally electricity. Pros of wind energy are clean power source, renewable power source, and low cost to operate. Cons of wind energy are that the turbines are noisy and ugly to look at, insufficient winds to meet the demands, and upfront cost of building is very expensive.
   C. If air can be used to generate electricity, then shouldn't this clean, renewable resource be used for power instead of polluting our world with more toxins?

II. Body
   A. Background
      1. Wind power is converted from kinetic energy into mechanical energy that is then used to create power.
      2. Wind power has been around for a long time. In 1857, David Halladay and John Burnham designed the first windmill in the United States.
   B. Pros
      1. Wind energy is a clean source of power and causes no pollution.
      2. Wind energy is a renewable resource that will not run out.
      3. It brings in jobs for those who may be unemployed.
      4. Its cost of operating is low.
   C. Cons
      1. Windmills are noisy and ugly to look at.
      2. There may be times where the wind insufficient to meet the demands for electricity.
      3. Upfront cost of building the turbines and windmills is very pricey.
   D. Compromise
      Use wind and solar energy together to replace the current resources used to create electricity.

III. Conclusion
   A. Wind energy has been around for years. Wind power is a clean, renewable, and least costly resource for generating power. Wind turbines are noisy and unsightly, at times insufficient, and very costly to build. Using wind and solar energy together could eliminate the cause for coal, natural gas, and nuclear resources for electricity.
   B. If air can be used to generate electricity, then shouldn't this clean, renewable resource be used for power instead of polluting our world with more toxins?

Imagine living in a world where people are no longer poisoned by the toxins that are emitted by the resources that are used to create the electricity we use daily. Many people use electricity in some form every single day, whether it is for lighting, cooling/heating, or using an appliance. Currently, coal and water, natural gas, and nuclear sources are the top three resources used to make electricity (Weiss, 2015). All of these current resources could one day run out. These three resources are also harmful to the environment because of the toxins that are released into the air. If a renewable source like wind were to be used, it would be better for the environment and cost less than the current resources because wind is free. Wind power (also called wind energy) is created by turbines that convert kinetic energy from wind into mechanical energy that can be used for electricity (Qamar, 2014, p. 25). Wind energy would not give off any harmful toxins, so it would be better for the environment than using other finite resources.

Wind energy has pros and cons associated with its use, but do the positive effects outweigh the negative effects, or vice versa? Wind energy has been used for centuries for many different uses. Wind is a clean source of power; therefore, there is no pollution. Wind energy is a renewable resource that will not run out although it may slow down at times. Building wind farms takes time and people. That means that there will be job opportunities coming to the area where there are plans to build. Although there are benefits of using wind turbines to create wind power (electricity), there are also disadvantages of having them. Wind turbines are noisy and unsightly. Since wind does not blow at a constant rate, there may be times when there are insufficient winds to meet the demand for producing power. The upfront cost of building wind turbines is very expensive, too. Wind is caused by the movement of air. If

air can be used to generate electricity, then shouldn't this clean, renewable resource be used for power instead of polluting the world with more toxins? Wind power is produced when kinetic energy is converted into mechanical energy by a wind turbine. Wind energy may be used for different purposes suchah producing electricity, grinding grain by machinery, and even pumping water by a device called a windmill or wind pump. Over the years, turbines have changed in shape and size so they may be used for different applications (Qamar, 2014, p.25).

Wind energy has been around a long time, and many generations have put it to use to perform different tasks in many different cultures in many different countries. For instance, "In the year 500, Persians (Iranians) harnessed the power of the wind and built the first windmills to pump water and grind grain" ("Alternative Energy Sources Timeline," 2014). In 1857, David Halladay and John Burnham designed the first open tower windmill in the United States. The windmill's blades were made of wood, and it was used on a farm. In 1887, the first automatic wind turbine was made by Charles Brush, who was an American. Over the last hundred years, wind energy has become a popular resource for energy, and "wind farms" have been built in many different countries. California and Minnesota have both become leaders in wind energy as a resource for power in the United States ("Alternative Energy Sources Timeline," 2014). Over the years, the designs for the windmills and turbines have changed to make them efficient for different tasks.

Wind itself is a clean resource that is generated by the movement of air. The movement of air is caused by the Earth rotating on its axis, causing high pressure and low pressure air to mix (Allaby & Morgan, 2003). Wind does not give off any harmful toxins that could damage/kill humans, plants, or animals. That is what makes it the best alternative for power compared to

nuclear power, natural gas, or coal. When coal is burned, it releases toxins, such as nitrous and sulfurous gases, carbon dioxide, and mercury, to name a few (Hudgins, 2010). Wind energy is the healthier option for producing a power source and would stop the pollution of the surrounding environment. If wind energy power plants were to take over the operations of all other power plants like coal, nuclear, and gas, then the pollution in and around these communities would become cleaner and create a healthier place to live. People generally want a safe place to start a family, and an area that does not pollute the environment would attract more people than a place that is saturated with harmful chemicals in the air.

Wind energy is a renewable resource that may slow down at times but will not run out. "Wind blows from high-pressure to low pressure areas" (Allaby & Morgan, 2003). The direction that the wind blows changes, depending on different factors like where you are (north or south of the equator) and what season it is. For example, winds tend to blow more strongly in the winter than in the summer. Wind energy is created by wind turbines that take in the wind and convert it into electricity that can be used by surrounding towns. Although there are many different wind patterns, the jet stream pattern is the one that has a huge influence with the weather. "The average speed of a jet stream wind is 105 km/h (65 mph)" (Allaby & Morgan, 2003). Although winds slow down at times, they will eventually start back up; therefore, it is a renewable source (Allaby & Morgan, 2003).

Building these wind farms will bring jobs for many people who are without work. Building a wind farm could create about 250 jobs for the area it is built in and put a lot of money back into community (Handy, 2015). There will be a need for skilled individuals who range from fixing the foundation, building the turbines, and even running the power lines.

Having these power lines run on an individual's property will also bring him/her compensation for the use of his/her land. Wind farms are very essential in the move to have power generated by wind. One wind farm that uses large wind turbines has the ability to produce 100 kilowatts to a few megawatts, which could power several thousands of homes ("How a Wind Turbine Works," 2014). "Wind energy costs have been reduced from more than 55 cents per kilowatt-hour (kWh) in 1980 to under 6 cents/kWh today in areas with good wind resources" ("How a Wind Turbine Works," 2014). Savings like that would be well worth building wind farms all over the world, which would bring more jobs.

The cost of operating a wind farm is lower than the cost of operating a coal power plant. Wind is caused by the movement of air. Since air is free, there is no cost to use it, unlike coal. The cost of producing power by wind is about 4-6 cents per kilowatt-hour (Hudgins, 2010). Wind power has the advantage over current power plants because they do not require other resources to burn to generate power. Not having to use extra resources to generate power is another reason why the wind turbine power plants cost less to operate. The more resources that have to be used to generate power, the higher the cost of operating will go. Wind energy seems to be the better choice all the way around.

While there are benefits to converting to wind energy, there are also some disadvantages, too. Wind turbines are generally big and noisy. Wind turbines vary in size, depending on what they are used for. These wind farms are considered dull and unsightly, causing many people to reject them. Many think that having power lines run across their property will decrease the property value (Handy, 2015). Wind turbines are also loud. The blades are made up of metal, and when they spin, they make an annoying grating sound.

People who allow these companies to run power lines on their property are compensated for the use of their lands. Some people who dislike these wind farms talk about using their money to buy a home somewhere else and just move away (Handy, 2015).

Wind energy is a great way of using a natural resource that doesn't pollute the environment. What happens when there is not enough wind to meet the demand to produce power? Wind power is considered intermittent power since the wind is not constant. Nuclear power plants and coal power plants are more reliable than wind power because they can run constantly by burning the needed resource to keep them going. However, these power plants burn their resources, and toxins are produced and emitted out into the air, causing pollution. Here are the current percentages of different resources are used: "Coal-39%, Natural Gas-27%, Nuclear-19%, Hydropower-7%, other renewable-6%, Biomass-1.48%, Geothermal-0.41%, Solar-0.23%, Wind-4.13%, Petroleum-1%, and gases<1%" (Weiss, 2015). Wind farms work together to generate power for communities. Currently, the United States has 48,000 wind turbines, with plans for more in the near future. With the way wind energy is becoming popular, we are well on our way to a healthier future.

While the cost of operating a wind turbine farm may be inexpensive, the cost of building one is highly expensive and can cost millions of dollars. The overall cost of building a wind farm consists of many aspects. Two of the commonly used turbines are those with the horizontal or vertical axis. One of the major contributors to running up the cost is the material used to build the turbines. Another cost is buying the land and getting the right permits and other legal issues that may arise. Laborers who will actually build the wind turbines will also need to be hired. Costs can add up really fast. The company over the project will also have to pay

landowners if they use their lands to run the power lines. Building wind turbine farms takes a lot of time and money to actually get one up and running. One project that the company NextEra is working on could cost around $400 million dollars (Handy, 2015).

Wind energy is great way to create power. It is renewable and clean, so it does not pollute the environment. The major problem with wind energy is that it is not constant, so there are times where there is not enough wind to create the power needed. There are still improvements that need to be made so that one day electricity can be powered by wind alone. Until then, couldn't there be a compromise to use wind power and solar power together? Neither one of these resources would cause pollution that would negatively affect the environment and everything that lives in it. Coal, nuclear power, and natural gas all release harmful chemicals into the air that is breathed in by humans and animals, which causes all sorts of illnesses. Solar energy and wind power working together could do away with any need for the other resources.

Wind energy has been around and utilized for hundreds of years, from grinding grain to now powering cities. Wind energy is a clean, renewable resource that provides many benefits for the environment since it does not emit toxins that pollute the air. Building wind turbine farms to produce power is also beneficial to the communities that surround them because they bring jobs that puts people back to work. Also, money is regenerated back into the community as people buy local goods that they need while they work. The cost of operating a wind farm is less than other resources because air is free. There are also a few disadvantages of producing wind energy. The wind turbines that are used to transform kinetic energy into mechanical energy are very unsightly and noisy, causing many people to reject the proposal of building

them. There is also a major problem with the wind turbines being insufficient in producing enough power since wind is an intermittent resource. The upfront cost of building a wind farm that is capable of generating enough power to run a community is very expensive. It costs millions of dollars to build a decent wind farm. There may be a compromise that could do away with the need for the resources that pollute the environment. If wind energy and solar energy were to be used together, they could compensate for one another when the other is working less than it should. Together they could be the compromise to becoming a greener (healthier) way to generate power and doing away with the current finite resources that are currently used. If air can be used generate electricity, then shouldn't this clean, renewable resource be used for power instead of polluting out world with more toxins?

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