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Energy and Environment
11/15/19

Opposition Against Wind Power in the United States

There is certainly a wind power boom in the United States in the past decade.

Wind power is a very important part of America's green energy strategy. It contributes about 6.6% of all the electricity delivered to the US consumers. In the country, Texas generates more electricity from wind than any other state (Irfan 1), and while the number of windfarms is rapidly increasing, there are communities and organizations which are against this method of producing renewable energy. They argue that wind farms have a negative impact on people's health, the ecology and wildlife, and the culture. Furthermore, some people believe that wind farms are not financially advantageous to the locals, but just to the big companies that are installing them.

In order to make a decision whether renewable sources of energies are beneficial and less harmful to the environment, a direct comparison between the new and the old ways of producing energy would be useful. It will also address the concerns of the people that are against wind farms, and state which method is more beneficial and less harmful.

Health concerns

One of the major concerns of the anti wind farm activists is that they pose a serious threat to people's health.(Haggerty 1) In Montgomery County in the state of Indiana, a group named "No Wind Farm Montgomery County" meets regularly to discuss new wind farms in the area. Residents say that more research should be done

on what is a safe setback for a specific height and for the capacity of a turbine. In order for a wind farm to be built on their property, residents need to sign leases before turbines can be installed. According to the group members wind turbines are generating too much noise because of their size. They argue that the constant noise is annoying and it leads to serious health problems. One of the members of the group states that wind turbines produce infrasound - soundwaves which are at frequencies too low to hear, but can seriously damage a person's hearing. Therefore, the Montgomery County group wants a regulation for noise and size of the wind farms, otherwise they would not sign the leases that allow the turbines to be installed on the land they own.

However, according to the scientists, most claims made from activists are exaggerated as turbine noise cannot cause headaches, loss of hearing, tinnitus, or contribute to poor sleep quality. (Waters 1) Extended or repeated exposure to sounds at or above 85 decibels can cause hearing loss. (NID, 2019) Sounds below 75 decibels are unlikely to cause hearing damage even after repeated exposure. The biggest residential wind turbines produce 57 decibels at maximum rotational speed. (Keane 2011) Therefore, it is very unlikely that wind turbines can cause hearing damage.

Another negative effect that the opposition mentions is known as the shadow flicker. (Science X 1) It is the effect of the sun when it is low on the horizon shining through the rotating blades of a wind turbine, casting a moving shadow. This could be a serious concern for people who suffer from photosensitive epilepsy and experience seizures in response to certain environmental triggers. This is possible if the turbine blades rotate at speeds faster than 3 hertz (flashes per second). Moreover, the sun would need to be bright enough, and in just the right position and angle from the horizon

in relation to the turbine, to cast shadows of enough intensity and length, and the person with photosensitive epilepsy would need to be looking at the turbine, with the sun behind the turbine. According to the data, photosensitive epilepsy affects up to only 3% of people with epilepsy. (Seri 1) Moreover, the aforementioned conditions happen usually during a clear day with no clouds, and as most people avoid looking directly at the sun, the risk of wind turbines triggering photosensitive epilepsy is very low.

Air pollution

On the other hand, coal plants emit toxins in the air that could affect many more people and cause much more serious diseases such as lung cancer. According to the American Lung Association toxins like Arsenic, lead, formaldehyde, hydrogen chloride, mercury, and dioxins are just some of the 84 toxins coming out of these plants. (“Coal” ALA, 2019) Just in the state of Indiana, 6,666,818 people are at risk of developing a disease related to air pollution. To make matters worse, coal plants release particles which are even more harmful than the toxins. They can enter deep into a person’s lungs or even the bloodstream and cause chest pain tightness or even lung cancer. Babies and pregnant women are also affected. For example, a baby can be born with low birth weight due to the air pollution.

Effects of wind farms on wildlife and natural habitats

The activists also claim that wind farms are disrupting the wildlife and negatively impacting the environment. They state that wind turbines can destroy the natural habitat of animals or even kill populations. According to an article in the New York Times, almost half a million birds are killed by wind turbines every year. (Rosenthal, 2011)

However, in the same article they also compare this number to the number killed each year by cats: 500 million according to estimates by the American Bird Conservancy. Of course people cannot get rid of cats and natural selection in order to preserve birds, but they can come up with a plan for the most suitable place to install wind farms. For instance, the behavior of birds during the migrating season can be studied. Their pathway could be analysed, so that wind farms are not installed at the same places. Cartographers can design a map where the conditions are optimal for producing wind energy and at the same time they do not interfere with the migration route of the birds. As a result the number of birds killed by wind turbines will be significantly reduced.

Recently, a lot of wind farms have been installed offshore to take up less space and be further away from towns and cities. However, the opposition claims that this could be a serious concern. (Sullivan 2012) They state that offshore wind farms could disrupt the marine wildlife and the fish population. Placing a large cement structure at the bottom of the ocean can certainly have a negative effect on the natural habitat of fish. However, several studies have been done in order to reduce the impact of offshore wind turbines to the marine wildlife. A team in the UK suggests wind farms to be installed offshore on artificial islands where they are away from fish populations and are not visible to the locals. This also addresses another problem with “visible pollution”, as the rural landscape will not be disturbed. What is more, wind farms on artificial islands will be far enough not to cause any noise to the local communities.

The opposition argues that offshore wind farms can kill fish population. (Sullivan 2012) At the same time there are large oil platforms extracting oil from the bottom of the ocean. These platforms not only disturb the marine wildlife but at the same time

possess a potential risk to the environment. In April, 2010, the worst oil spill in US history happened. (Ocean Portal Team, 2019) After the explosion and the sinking of the Deepwater Horizon oil rig in the Gulf of Mexico a dozen people were killed and the damaged pipes were leaking oil and gas 42 miles off the coast of Louisiana. By the time the well was capped on July 15, 2010, an estimated 3.19 million barrels of oil had leaked into the Gulf. This had a devastating effect on the marine wildlife. Birds and fish were covered in oil and washed up on the beach. It will take decades until scientists understand the total impact of the spill. Not to mention the resources that were used after this catastrophe in order to clean-up as much of the oil as possible. This event shows that the old methods could be way more dangerous compared to the renewable energy resources used for energy generation.

Wind farms using croplands

Wind farms take space. This is a major concern for land owners as big companies are approaching them in order to ask them to sign a lease to use their property. According to the opposition this could be a problem, because cropland is taken out, and fewer jobs for farmers are available. (Hayden 2) In Michigan, in Sanilac County, a big company named "Exelon" developed a project which spans over 20,000 acres across farmer's land. Most of the local people are concerned that this might end their small business and they would not be financially secure. However, the company assures them that Sanilac County will reap tax revenue benefits and people will get a personal lease payment each year. A person will be paid a fee of 15\$ for each acre and 2% of the windmill's gross income, according to the article. Moreover, a single turbine

physically sits on one acre of land, providing farmers with enough space around them to continue producing their crops. This will assure a stable income for the farmers and at the same time the people who own the land will be using cheaper energy provided by the company. In addition to the lease payments, the CEO of “Exelon” said that the local community will benefit from job creation spawned by the project. The construction of the project, which took about nine months, created approximately 120 jobs. Ten more jobs were provided to maintain the turbines.

Solar panels instead of wind farms

The opposition suggests that instead of wind farms people should invest in solar panels which are smaller in size and not as noisy. However, Wind turbines are cheaper to make and take minimal staff to maintain. They also produce more electricity on average. An average onshore wind turbine with a capacity of 2.5–3 MW can produce more than 6 million kWh in a year. (Hayden 3) On the other hand, 5 and a half feet tall and a little more than 3 feet wide solar panel produces about 360 kWh a year. Therefore in order to produce the same amount of electricity as one turbine produces a year, one will need 16,500 solar panels. This is a massive number and if a company wants to produce electricity for big cities, they will have to use a lot of space to install the solar panels. Therefore, solar panels might end up using more space than a wind farm which will drastically reduce the available cropland, a concern discussed in the previous paragraph. Solar panels also tend to be more expensive and a larger initial investment is needed. The amount of electricity produced by both wind farms and solar panels is

heavily dependent on the environmental conditions, so the above mentioned numbers are approximate.

Business competition

Another thing to take into consideration is that anti-activists may be financed by large oil and coal companies that may be losing their shares in energy due to the developing sector of wind power. For instance, Canadian energy producer, Innergex Renewable Energy Inc., backed off from building two wind farms in Clay County, Texas, because of anti-wind farm activists. (Collins 1) The movement was led by John Greer, an oil investor, who organized a community against wind farms to stop the project. According to Greer, wind farms disrupt the local rural farms and interfere with the radar operations of the military airbase close to the project. The article says that Greer is not influenced by his oil business, a statement which I highly doubt. If the two wind farms were built this would mean that they produce cheaper and greener energy with minimum taxes. Therefore, his business share would significantly shrink which is definitely not beneficial to him. In my opinion, the attack against wind farms is nothing else but just a trick so that he can continue to make money out of his oil company. This is why he uses other arguments that the wind farms would destroy the rural landscape. The moral question is, what makes people think that oil companies do not disrupt the rural landscape but wind farms do? Do they prefer looking at the more dangerous oil plants or the highly technological wind turbines? People need to figure out where to draw the line between negative impact and positive gain.

Wind power in Denmark

In comparison, Denmark, one of the top ranked countries in wind power production already harvests the fruits of its labor. The effect is tremendous as wind power contributes more than a third of the Danish electricity production. In the country, electricity from renewable sources is mainly promoted through a premium tariff and net-metering. (Energityrelsen, 2019) No taxes for transportation, storage, selling and buying energy are collected. As a result, companies are investing more and more money in installing wind farms. It is also true that Denmark cannot rely on its oil coal and oil plants as much as the US. This is why they came up with an alternative solution that lowered the emissions of carbon dioxide and ranked the country on the 3rd spot on the list of countries with the best quality of life, according to the USnews newspaper.

In conclusion, any human-made structure or energy source has a negative impact on health, ecosystems, and culture. The opposition against wind farms made their point and their concerns need to be taken into consideration in future projects. Organizations and companies should think of a way to minimize the negative impact of sources generating energy. However, if we draw the line, renewable energy sources pose a much lower risk in all the aforementioned categories compared to oil and coal plants. The future has to do with renewable sources of energy and minimizing their negative impact on communities and the environment should be a top priority.

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