Don Quixote Was Right After All!
The Truth About Windmills

“This year, your company successfully installed 12 windmills in the Satara district. This has reduced the carbon footprint of your company by xx units and contributed in the state government’s endeavor to increase the installed capacity of electricity generation in the state”.

Companies want to shout out these activities to the world. It’s common to see such statements in annual reports. It’s common to see windmills on the horizon. It’s common to feel that everything’s right with the world when the wind produces our electricity. We believe what we are made to believe. Windmills save precious fossil fuels. Windmills take nothing from nature and turn it into electricity for us. Nothing short of magic. Government subsidies help corporations put up more windmills which produce electricity out of nothing. More benefits to the society, more sops for corporations, more windmills being produced…… the world’s a happy place. Generous support from government means regulations bent to order, utility companies made to buy from producing firms and green credits traded. After all, windmills do no harm to the environment, need no inputs from nature and no waste is thrown out. Utopia.

Windmills – The inconvenient truth

“No get ready to hear this. Windmills harm the environment in many other ways than one. Wind farms are known to cause health problems to some who live within its vicinity. Windmill blade manufacturers have been consistent defaulters of US environmental laws. It is expensive to treat pollutants and dust from the blade manufacturing process. It is simpler to have workers don gas masks on the shopfloor. The size of the modern
windmill requires large construction equipment, huge amounts of piling and foundation and modern machines to make all this equipment. The windmill is a product of industry. It requires energy, natural resources and fossil fuels for manufacture and installation. Giant wind farms demand large landscapes. Top it all up with the bitterest fact – wind power is an unreliable, intermittent source of energy. Most windmills produce on an average just about 20% of their installed capacity."

**Installing these Friendly Wind Mills**

Digest this: A 1.5 MW wind turbine has a tower about 80 meters high. The blades and hub weigh about 20 tons. The nacelle, which contains the generator component, weighs around 50 tons. This behemoth needs a foundation of about 20 tons of reinforcing steel and more than 150 cubic meters of concrete. The base is about 15m in diameter and more than 2m thick near the center. Modern windmills have blades of 20 meters or more, cutting a vertical air space of up to 2 acres. Hundreds of liters of oil are stored at the top of the tower. The whole assembly weighs 100 + tons. Can you imagine what it means for installing these giants on hill tops of Satara district?

Large earth moving equipment, gigantic cranes and huge foundation craters are needed for these wind turbines. Wide and straight roads need to be cut up on hills. The roads cannot have turns like normal roads since trucks bringing in the 21 meter blades can’t turn like a Nano can. Construction of these roads needs earth moving equipment, stones, gravel, bitumen and of course fossil fuels! Giant craters are dug up on these hills which may need blasting through the bed rock. These holes are later filled up with reinforcement steel and cement concrete. Windmills need a minimum separation distance. This spreads them out requiring felling of trees. The construction of roads and craters destroys habitat of the local flora and fauna. Alteration of the landscape and the subsequent erosion ensures continuous destruction for the years to come. The government argues that wasteland is converted to wind farms, so there. The government does not tell you that ‘wasteland’ is for industry – in nature, there is no such thing as a wasteland. There are thriving ecosystems even in places which man has no use[i]."

Do the annual reports mention the quantity of fossil fuel
required to produce the construction equipment, steel, oil, copper, and wind mill equipment, road making machines, bitumen, cement, stone crushing equipment and cranes? How about the electricity consumed in producing blades? How much pollutants were released in the air for making the blades?

Do the annual reports mention the financial impact of cutting down age old trees, altering landscapes, destroying habitat and displacing wild life?

Hills divide the rain into watershed areas. When there is such large scale alteration on the hilltops, water flows are disturbed. This increases soil erosion, can induce water logging, alters the water table in that area and consequently precious soil is lost forever. When roads are cut on hills, the debris is thrown on the slope side of the new road. The debris is rock and gravel, no soil. It would take years for anything to grow on these new slopes. Roads and cement pavers do not allow rains to reach underground streams.

**Producing these Friendly Windmills**

This is what The New York Times[ii] reported on 25th December 2009:

**GUYUN VILLAGE, China —** Some of the greenest technologies of the age, from electric cars to efficient light bulbs to very large wind turbines, are made possible by an unusual group of elements called rare earths. The world’s dependence on these substances is rising fast.

Just one problem: These elements come almost entirely from China, from some of the most environmentally damaging mines in the country, in an industry dominated by criminal gangs.

Wind blade manufacturers are perennial defaulters of environmental laws in many countries[iii]. In 2009, Suzlon manufacturing facility in the US faced a fine of $ 490,000[iv] for pollution norm breaches. Such cases are unlikely in India, since we do not have strong and updated pollution control regulations and very poor enforcement, if at all any. Thus there is a spurt of wind blade manufacturers in India.

**Operating these Friendly Windmills**

For a better wind efficiency, there should be no trees around the turbines. Vegetation is discouraged by use of herbicides – poison for the soil and water.
It is not difficult to imagine the impact of a wind turbine farm on birds and bats\(^v\). Recently, there was disturbing news that over 200 flamingoes were killed in flight in Gujarat due to the presence of new power lines. Such power lines crisscross the area. Indians have already endangered several species. Windmills do their bit in the process of elimination of the species. It is not hard to figure out why wind turbine farms are devoid of animal and bird life.

Hear this about the noise created by windmills. The mechanical parts, air cutting noise and the electrical hum, together produce a unique low frequency sound which is carried far. To be fair, engineers have improved the movement of gears and bearings, but there’s still nothing much they can do to the noise of electrical generation. The chopping sound of blades cutting through air is hard to ignore. This has triggered many complaints from wind farm neighborhoods in the US. The noise they say is unnatural and hard to live with. It gets especially annoying during the night. Doctors agree to health problems caused by wind farms – disturbed sleep, stress, hypertension and dizziness are just some of them. A recent book “Wind turbine syndrome\(^vi\)” documents some of the health concerns of people living around wind farms. Some governments have acknowledged this correlation and are promoting a ‘buffer zone’ between wind farms and habitation.


**Power Generation from the Friendly Windmills**

Most of the wind mill industry reports including the GWEC, EWEA report the “installed capacity” of wind generation. This means nothing. Wind on the wind farm is not guaranteed. Climate change has set in further unpredictability in weather. We have seen wind patterns change in the last 20 years. The “capacity factor” is the ratio of the electrical energy produced in a given period of time to the electrical energy that could have been produced at continuous maximum power operation during the same period. Wind farms all over the world are run at around 20% capacity factor.
Wind energy is thus unpredictable and intermittent. And yet, the entire infrastructure needs to be created on the basis of “installed capacity” which may never be realized in the life of the farm.

The Way Ahead

It is hard to publish such views. Someone with even wee bit sympathy towards the environment is made out to be against progress. Don’t get me wrong – windmills harm environment, yes. But that’s today. We have every reason to believe that man can turn them into giant friends which would prove Don Quixote wrong.

The point I make is that there is no need to go overboard and incentivize corporations to install them. Today, that would only benefit corporations and harm environment. Especially for India, we must exercise environmental regulations in the production of windmill blades; else it would not be far that only India produces these for the world. Regulations about land use for windfarms – we need that too. Many countries have already put windmills offshore in the sea. This seems (at least now) to be better than wasting precious land.

We do not know the consequences of large scale wind farming. We cannot predict how nature will react to them. All we can do is to keep a check on our greed, acknowledge the existence of non-human beings and leave a bit of earth for them. We have enough already.

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References

http://www.windwatch.org/
[vi] By Dr. Nina Pierpont