

GREEN TECH THE SERIES COLUMN FOR MARCH 3, 2016

HEADLINE: WIND ENERGY; A CONTROVERCIAL BENEFICIAL ENERGY

There remains much controversy surrounding wind energy and the use of wind turbines to generate this renewable resource. Most of the negative opinions are related to loss of property values, noise and related health issues. While I see both sides and have a personal preference to solar, I recognize that solar photovoltaic power has limitations; we have yet to develop a method of storage for this power on a large scale capacity and solar has definite peaks and valleys for providing electricity to our power grid.

Wind energy has grown around the world with our neighbours to the south well into the use and development of that resource. In the US, wind energy costs are now lower than most new conventional sources and rapidly closing in on cost competition with respect to a new natural gas generation installation. In fact, in the US, the overall cost of wind generation has declined close to 90% since the early 1980's and they have over 13,000 megawatts of new wind capacity on the books right now. Australia is at the point where wind energy is cheaper to install than natural gas generation and the wind power energy "down under" now provides over 6% of all of the electrical requirements by volume for that country. India is seeing similar benefits, wind is now cost competitive with coal, their number one generation method.

The power output of a wind turbine is a function of the average wind speed and if the wind speed doubles, then the power output actually increases eight fold. The height of the turbine towers and their location are enormous factors for wind energy; the taller the tower, the greater the wind speed. For an example of how location is a major factor consider that, due to the greater air density, a tower in north central Canada in winter will produce more power than one in southern California during the summer. Higher elevation is also a factor, but here, access to the power grid is a limiting factor. While northern Canada has documented high wind speed, the catch is that there are no transmission lines to feed the wind power to. In the US in 2012, the cost of long term wind generation contracts was just 4 cents a KWH; that is 50% lower than it was three years previous.

The flip side is the often heard opinions that these things are ugly and that's a tough argument to defend. Recently though, I have had some interesting ideas cross my desk and some of them, I think, they are worth sharing. One design from the US company called "Sheerwind" is very innovative. They have developed a

wind “funnel” of kind, where the wind is captured at the top of the funnel. According to the material I have the, “Invelox system collects wind through a 360 degree intake. This wind is then directed through the funnel, concentrated and further accelerated in a venturi effect. Something like moving water through a pipe and then reducing the size, hence the water pressure decreases and the velocity increases. Wind is delivered to the turbine/generators to convert the accelerated wind to electrical power. Invelox is the first wind tower capable of powering multiple turbines in a row.” This company states that their system will bring wind power closer to the ground for safer, easier and cheaper operation and maintenance. They also claim that their Invelox wind towers produce power at much lower wind speeds than current wind towers.

The other development in wind energy is the “Vortex Bladeless” wind turbine that looks like a giant, hand rolled, cigarette pointing towards the sky. This Spanish company captures the wind energy from what is known as vorticity, an aerodynamic effect that produces a pattern of spinning vortices. In 2010, they decided to try and turn this vibrating energy into electricity and claim that their product, which stands about 41 feet tall, can capture up to 40% of the wind around it in ideal conditions, the wind blowing at around 26 miles an hour. They advertise that there are no gears and mechanical moving parts, totally silent and safe for birds as there are no moving blades for them to fly into.

The most recent wind turbines, or should I say “wind tree,” has been developed in France and was introduced last year. The company, “NewWind,” calls their wind device the “Tree Vent.” They look like a piece of modern art and are causing quite a stir in France. Positioned as a group of trees, they are, individually, capable of producing approximately 3.1 KW, which may not seem like much but put a group together and this factor changes. They make two sizes; one at 36 feet high and the other at 26 feet. The latter model contains 63 “aeroleaves.” These leaves contain tiny blades and can generate power with wind speed under 7KMH. That’s got to be the lowest collection of wind speed I have ever seen. The higher tree holds 72 aeroleaves that sit vertically on the branches. This design eliminates any noise. The leaves are constructed of plastic and coated with a resin for protection from the elements. Their first Tree Vent is projected to be in operation in Paris by early May of this year. I will be watching for further developments on this unique wind generation system.

While the folks in Alberta hope this oil price break will be short lived, for multiple reasons we need continued development of renewable resources.

Innovations, such as these three companies are developing, show we can do better than the large wind turbines of today.

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