

# Thoughts on Wind Farms

A.E. Simeoni 2009



Single Wind Turbine at Inishcrone Coastal Wind Farm, Ireland



Cro' na Leacht Coastal Wind Farm, Ireland

*At the 2008 Republican Convention... “Rudi Guilani led the delegates in a chant of ‘drill, baby, drill...it reminds me of someone who, - on the eve of the IT revolution – on the eve of PCs and the Internet – is pounding the table for America to make more IBM typewriters and carbon paper. Typewriters, baby, typewriters.” (Thomas L. Freidman, International Herald Tribune, September 15, 2008.)*

Drilling and mining fossil fuels to support energy production is technology of the 19<sup>th</sup> century. Fossil-fuels have served our country well through the age of industrialization, the age of modern conveniences, two world wars and numerous conflicts. Fossil-fuel has also been the primary source of air pollution which has lead to numerous health issues in our population as well as irreversible environmental problems which pose many challenges to the future of our planet. Development and production of renewable energy is technology of the 21<sup>st</sup> century. Over the past several decades renewable energy in the U.S. has experienced much controversy and very limited advancement. The massive California wind farms erected in the 1980s' were controversial not only in their monumental scale of development but also in their poor turbine design, noise, shadow flicker, impact on the natural environment, visual intrusion and gradual decline. This early effort to produce renewable energy by harnessing the wind has had a negative impact on wind energy. It set the U.S. wind industry two decades behind Europe. Fortunately for the wind industry, European wind turbine manufactures have led the charge in research and development in a continued effort to produce the best possible machines. They have made many improvements to their wind turbines. The issues of noise, shadow flicker, output, reliability and visual impacts have experienced improvements across the board. Because the blades of the newer turbines move much slower, shadow flicker has been greatly reduced. Slower blade movement has also influenced less wind turbine noise. In fact, many of the new turbines make less noise than the wind, which passes through them. Output has increased from 500kw-650kw to machines which range from 1mw to 5 mw. At the present time, Europe is undergoing a transition from first and second-generation wind turbines to re-powering with sleek new (third-generation) wind turbines, which yield more than two to three times energy than their predecessors. Reliability and ease of maintenance has also been addressed and repair/down time has been brought to



Transformers at the Taurbeg Wind Farm, Ireland

a minimum. As a result of these many improvements, countries such as Germany and Denmark, who are heavily invested in wind energy, are continuing to experience growth in kW-hour production while reducing the actual number of wind turbines in the landscape and above all, they are reducing fossil fuel dependency.

The Europeans have essentially reinvented the wind turbine through innovation and design. During this time our country's leaders have turned a blind eye to innovation and energy independence. We have become a nation addicted to fossil-fuel and continue to rely on foreign import and explore pristine natural landscapes for oil to satisfy our needs while ignoring the possibilities of implementing other alternative forms of energy production. Because of our addiction to fossil-fuel and increasing energy needs, our leverage as a world leader continues to erode. Should we reinvent our landscape of power through innovation, engineering and design or should we continue to "drill, baby, drill"?



Painted Tower at the Findhorn Eco-village Wind Farm, Scotland

#### *Myths of wind power.*

In the realm of wind energy, many myths have emerged. Myths such as: wind energy production is not economically viable; it is unreliable; it is not always available; it harms wildlife; it is inefficient; it is a safety risk; it is a health risk and it is ugly have created confusion and questioned if wind energy is worth pursuing. In response to these myths supporters and opponents of wind have fueled their responses, some grounded in scientific and economic evidence and others remain fictional hindrances. The members of our communities deserve the truth if we want to start turning things around. I believe that the collaboration of scientists, planners, designers and engineers will help to clear the air and get us moving in the right direction.



Island of Samsø, Denmark Wind Farm



Island of Samsø, Denmark Offshore Wind Farm

*On grassroots community involvement... “Then quite deliberately, the residents of the island set about changing this. They formed energy cooperatives and organized seminars on wind power. They removed their furnaces and replaced them with heat pumps. By 2001 fossil-fuel use on Samsø had been cut in half. By 2003, instead of importing electricity, the island was exporting it and by 2005 it was producing from renewable sources more energy than it was using. ...Once people on Samsø started thinking about energy, a local farmer explains, ‘it became a kind of sport’.” (Elizabeth Kolbert, ‘The Island in the Wind’, The New Yorker, July 7, 2008.)*

Through discussions with Europeans I have learned that community involvement through the planning process and also community ownership (full or shared) of wind farms yield a positive response to their presence. This was observed on the Island of Samsø in Denmark. Samsø, a small agricultural community has 21 wind turbines. Since the community was involved with the project from the outset, there has been little opposition to their presence. The Samsø municipality owns five of the island’s turbines while local and national and energy investors own the remaining turbines. Visual impact studies were conducted to inform the community of how the turbines would appear from various points on the island. The islanders are quite proud of their windmills and economic benefits they have provided. According to the island’s Energy Akademi, energy is abundant on Samsø and the island exports over 25% of their wind energy to the Danish grid. The profits from this energy export have funded new recreational and educational facilities as well as paying off the costs of the community owned wind turbines. It should be noted that the Energy Akademi, an educational, research and outreach facility, a world-class center for alternative energy, has been funded totally from wind energy profits. Samsø is an example of how community involvement and thoughtful planning combined with community ownership of wind turbines can have a positive spin on their acceptance and aesthetic issues.



Wind Farm in Puttgarten, Germany

*Aesthetics, Visual Impacts and respected citizens on the Cape Wind proposal. “I would not put a wind farm in the Boston Common or in Central Park or in Yosemite!” shouted Robert F. Kennedy Jr. “There are certain places you should not put it!” ... “People want to look out and see the same sight the Pilgrims saw.” (RFK)... “The sight of them bothers me”—Senator Edward M. Kennedy... “I don’t think these things can possibly be considered attractive in any way. I don’t care what colors you paint them or whether you have them dancing in unison to music or what. They are big ugly things sitting out there in the middle of what should be pristine waters...” Walter Cronkite (Cape Wind, Williams and Whitcomb, 2007.)*

The 1940's and 50's was a period of energy expansion and power plants were being built or upgraded to accommodate greater electric demands. Communities welcomed new power generating facilities and their towering transmission lines because it was a sign of progress and innovation. The end result was that progress and innovation trumped visual and aesthetic issues as the new power generating facilities were meant to improve the quality of life for everyone. Today the general public continues to enjoy the benefits of these upgrades as we find comfort in our heating and cooling needs, enjoyment in our electronic devices and convenience in our kitchen appliances. However, as we look towards the future we need to make adjustments to energy usage and generation in order to address issues of global warming.



Wind Farm in Schoneberg, Germany

Presently, in southeastern New England, visual impact of wind turbines in the landscape is one myth that continues to challenge their development. In the case of the Cape Wind proposal, it appears that as social class increases, community opposition to the visual impacts also increases. One side of the fence views them as ugly and threatening while the other side views them as elegant and a symbol of progress. Clearly it is difficult to hide a modern 300' tall windmill in the landscape and for this reason their visual impact has created much controversy in how these 'green giants' are perceived. Aesthetics and visual quality issues have caused delays of many wind farm projects. The problem is how does one site wind farms in the landscape which addresses these concerns in a manner to gain acceptance and allow our communities to benefit from their presence? To begin to answer this question, I spent 11 weeks traveling throughout Europe to visit a wide variety of coastal wind farms.



Road to Sexberium, Holland: a View of the Old and the New

*Regarding the aesthetics of wind power... “For some, they are worse than ugly, evoking deep fear in their enormous scale. For others, they are beyond magnificent, evoking deep religious feelings. More common associations with modern windmills include economic benefits or threats to market share (for fossil-fuel interests); reduction of disease in the reduction of polluting emissions; and real or bogus environmental threats.” (Lefteris Pavlides, Ph.D. Professor of Architecture, Roger Williams University, Providence Journal, Monday March 7, 2005.)*

Visual design and aesthetics are difficult issues to address; it can make a wind project fly or stop it dead in its tracks. It is the responsibility of design professionals to plan for visually appropriate wind farms that respect the character of the landscape and the concerns of the community. Planning for visual impacts should involve a thorough analysis of landscape character, the cultural landscape and views from transportation corridors with an eye for community input, especially, regarding landscape values. This visual impact analysis should become an overlay to the many layers of social and environmental planning to secure the best possible sites for wind farms with our state and region and country.