

Parliament of Australia
Senate
Community Affairs Committee
The Social and Economic Impact of Rural Wind Farms:

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Thank you for opening to public inquiry the subject of wind farms and for giving me the opportunity to express some of my views on the matter.

My knowledge about wind power has been gained from circumstances and experiences in Galicia, one of the 17 autonomous communities of the Kingdom of Spain, and it comes from living and traveling about and observing, and by an interest in nature conservation and rural development. I do not have technical knowledge on wind energy, as it will become clear, but I have strong feelings about the inadequacy of this type of energy, some of which I will try to explain.

It is my opinion that wind power installations have not been a positive addition to our lives: they have destroyed the landscape; they have diminished the already small land estates; they have contributed to pushing people away from the rural areas, already a generalized problem, but certainly one that the presence of the wind industry has not helped remedy; they have added grief and discomfort to people's wellbeing; they have added kilometers of roads and paved ways that are only practical to access the wind farms and that sometimes, if not always, local administrations have to maintain at taxpayers' expense; they have not provided any significant jobs either in number or quality; they have not lowered electricity bills, they have not even guaranteed reliable continuous service; they have added kilometers of cables to an already clouded sky with wires of all kinds; they have inflicted countless injuries and death to fauna and have permanently destroyed flora; they have, at best, altered water sources, when they have not drained them; they receive subsidies and accounting advantages that take funds away from necessary public services.

Spain has consistently ranked among the first countries on installed wind-energy production capacity and on reported wind energy production. The main Spanish industry association, Asociación Empresarial Eólica (AEE) reported that the newly installed capacity for the first two quarters of 2010 was 727 megawatts (MW) (Renewables International 2010), making Spain the European Union (EU) member with the highest installation figures for 2010: 1,516 MW, followed by Germany with 1,493 MW (Renewable Power News).

Within Spain, Galicia has held intermittently (which might be natural since we are talking about wind that blows intermittently also) second place to its neighboring autonomous community of Castilla-y-León. As of August, 2009, Galicia had approximately 4,000 wind turbines on its fewer than 30,000 square km, a density that was almost three times the Spanish average and that represented, with 3,459 MW installed, about 20% of the total Spanish installed power (Simon *et al*, 2010).

The apparent Spanish popularity of wind power is more the result of good marketing and juicy government subsidies than of critical and responsible appraisal or popular enthusiasm, although opposition to such a proliferation of industrial wind installations receives less media and official attention than the industry's selling points. The marketing by wind power interests is, understandably, driven by a desire to maximize their financial returns. What is less easy to identify is the politicians' blind, almost subservient, support to the implantation of wind turbines (and high concentration in Galicia's case, with more threatening to come in the near future) of all over the land (no off-shore installations yet in Spain).

It must be said that the EU has made part of its energy policy that 10% of its energy consumption by the year 2020 has to come from renewable sources. The wind mill sprouting epidemic is, in part, the response to this objective of which wind energy seems to be the star (EU Road Map. 2007).

But the commitment to reduce air pollution and fossil fuel consumption will not be realized by shifting consuming preferences to wind produced electricity because the blowing wind is about the only pollution free element—if it is clean air, and since it is not continuously available, consumers need to depend on energy from other sources.

Wind power is inefficient and environmentally unfriendly, apart from giving us installations markedly lacking in beauty. Even granting that there might be some who actually like the looks of the wind towers and blades, it is practically universally held that they don't belong in the middle of natural settings, some of them landscapes of great beauty, some with historic and/or ethnographic value that the industrial wind installations devalue, and some in densely populated areas. There seems to be a universally held unspoken agreement that wind turbines should not show up in tourism promotion materials. There must be a reason for that.

Wind energy costs

One of the first mentioned "advantages" of wind energy is that it is free, but its production carries costs both accountable and intangible, among them:

The cost of land, measured in money and in social cost (loss). The wind "commodity" is collected on someone's land. Aside from the land owner's right to the use and enjoyment of his land and the deprivation he suffers when the land is converted into an industrial wind site and retired from an ecological and sustainable use, land is also a social good so that its use, abuse or destruction affects us all. The loss or destruction of biodiversity and landscape that wind farms impose are irremediably lost for a long time, and probably forever.

Landscape. Even wind farm promoters, while asserting that the installations' impact on the landscape are minimal or easily tolerated, feel that they have to dress up their pretensions in creative ways. Sometimes, they resort to offering remedial "landscape integration strategies," "naturalization of surroundings," "hiding [the installations] as much as possible," "mimesis" and "creation of new relationships with the surroundings in order to achieve a singularization [?] of the elements..." Equally, they say that "the turbine exterior components will be white in a semi matte finish, without sharp edges or reflecting metal surfaces. It is considered that these design criteria reduce significantly the existence of chromatic contrasts with the surrounding landscape that could affect its quality..." (DESA, 2009)

Although there are those who claim that the wind turbines do not affect the quality of the landscape (there are even some who say that they enhance it), wind farms can be considered blight on the landscape: they are elements that simply do not belong there, and neither do the transportation lines and the substations receiving the farms' output, particularly when all these elements are located in the proximity of residential areas or in the proximity of

population centers, even small rural ones, which it is not a rare occurrence. Galicia offers some notable examples of less than comfortable closeness between wind turbines and/or evacuation lines and family homes.

The lack of appeal and resulting decrease in real estate values in the vicinity of wind farm installations (turbines, electric lines and ancillary buildings) is an important economic consideration resulting not only from their visual aggressiveness but also because of their perceived association with diverse health hazards.

Economic gains

Subsidies. The wind promoters receive considerable amounts of public funds and financial advantages from the public sector, either openly or covertly, that may take the form of guaranteed prices, tax breaks, write-offs, the building and/or maintenance of access roads to the farms, and favorable legislation or favorable interpretation thereof.

Repowering, increasing the existing turbines power to increase the wind farm electricity production instead of installing new ones, is sometimes preferred because it avoids new installations with all the costs and destruction that they would entail, although the visual impact, noise, and danger to avifauna may increase. However, what can be qualified as a minor evil becomes a big evil if the government charges taxes per wind mill and not per nominal power, so that a wind company could increase its benefits by increasing power and still pay the same taxes as before (El País, 2010)

In the last couple of years, when economic conditions began to sour, wind farm development seemed to have adopted a more somber, sober, and slower pace (EWEA). Still, some have ventured that the next economic bubble will be blown by the wind, so to speak, or because of the wind, because the new object of speculation will be the *alternative energy* field (Janszen, 2008).

Job creation. This is another big myth about wind energy. The building of a wind park uses human labor, usually crews more or less specialized that go from farm to farm working for the same promoter or for others, but the local permanent employment offered is generally rare and low-skilled. Equally, sometimes the

promises, hopes, or interpretations of reality seem to come up somewhat short (Leaked Report, 2010)

Health hazards

Avifauna. The reported casualties suffered by birds *and* bats are numerous, although the real data are not known due to the remoteness of the installations and the unwillingness of the wind industry to acknowledge the damage. There are interested claims that the avifauna can see or detect the turbines but they are not scholarly corroborated:

... researchers concluded that a large percentage of bat fatalities taking place around wind turbines are caused by barotrauma. Although fly by bats can sense the moving blades with their echo locating system they are not able to detect the sudden pressure drops ahead of them motivated by the high-speed rotating blades. When entering an high-pressure zone around the blades the bat lungs expand with an excessive quantity of air utterly damaging them (Baerwald *et al*, 2008).

The most important problems related to bats are:

- collision
- loss of foraging habitat
- barrier effect of commuting routes
- emission of ultrasound by wind turbines

The impacts are more or less severe depending on site selection, season, and species.

Birds, the same as bats, suffer injuries and perish by colliding with moving blades, tower and other infrastructure, including guy wires and power lines, or get hurt by the wake behind rotors. Collision deaths are particularly detrimental to long-lived, slow-to-reproduce species (eagles and bats).

Birds and bats suffer also from disturbance/displacement/exclusion from the area around wind turbines due to turbines, vehicles, people and/or construction. Also damaging are the barriers to movement disrupting feeding, breeding, migration, etc., and change or loss of habitat. (Weed, 2006).

Infertility in farm animals. Some animals are particularly nervous and sensitive to outside undesirable stimuli. Such appears to be the case of farm rabbits which are known to stop reproducing if they lack quiet living conditions, which

makes inadvisable the siting of rabbit farms within hearing range of the wind park. (Neighbor)

Human living environment. There are numerous national and supranational regulations regarding noise level emissions in human living environments, and there are generally established varying regulations for industrial settings. Still, there is an increased interest among health professionals and sound and aeronautic technicians on complaints ranging from noise inflicted discomfort and stress to health problems (arrhythmias, vertigo, deafness, sleep alterations, ear ringing, stress and anxiety) attributed to proximity to wind parks. (Acoustic Ecology 2009)

The discomfort or injury produced by wind turbine noise has been the subject of research from several perspectives ranging from physics and human and animal health to wind turbine and wind park design, and it has led to the gathering of researchers and exchange of information. For example, there were the First International Conference on Wind Turbine Noise, Berlin, Germany (2005); Second International Conference on Wind Turbine Noise, Lyon, France (2007); Third International Conference on Wind Turbine Noise, Aalborg, Denmark (2009); and Fourth International Conference on Wind Turbine Power, Rome, Italy (2011).

Effects on the land and on biodiversity

Use of heavy machinery. Wind promoters argue that the use of heavy machinery is limited to the construction stage of the wind park, but they fail to recognize that its effects are severe and long-lasting. Some of the important damage is due to transportation of heavy and bulky equipment and components that often requires widening of existing roads and/or building of new ones and that causes damage to buildings or other structures on the way, and to contamination because of the heavy use of fossil fuels.

Additionally, there's damage to the ground itself (elimination of flora and loss of layers of the richest top soil) and to surface courses and underground water sources because of excavation and/or blasting, earth-moving manoeuvres and assemblage of parts. There's affection to properties adjacent to working areas, blockage of roads to local residents' use, caravan transport of components and warning vehicles, noise, and dust.

There is destruction of natural land, farm land, and forest land that is permanently retired from its productive use. Even after the demise of the wind farm, it is highly unlikely that the occupied land can be rehabilitated. With the loss of the land, we also lose natural habitats for fauna and flora and alter/destroy water courses.

The demise of the wind farm can represent a serious problem. There is a 2008 study showing that all the towering wind machines that are being installed now might be millions of tonnes of scrap metal by 2040, much of it unrecyclable. (National Wind Watch, 2008)

Road construction and farm installation. See *Use of heavy machinery*, above.

Abundant use of concrete, a heavy pollutant mainly due to the high level of CO2 emissions during manufacture.

Increase in (building/maintenance) costs to (local) public administrations, which is to say taxpayers. Newly create roads of access and service to the wind farms may be built at public expense and, even if built by the wind promoters, may remain to be maintained by public administrations

The amount of energy that wind farms require to operate is considerable and obtained from the grid, not from the farm's own generation and it is not generally acknowledged. Manufacturers (Vestas, GE, and NEG Micon are mentioned) do not indicate the electricity consumption of the turbines they manufacture (Miller).

Additionally

Whatever the actual amount of consumption, it could seriously diminish any claim of providing a significant amount of energy. Instead, it looks like industrial wind power could turn out to be a laundering scheme: "Dirty" energy goes in, "clean" energy comes out. That would explain why developers demand legislation to create a market for "green credits"—tokens of "clean" energy like the indulgences sold by the medieval church. *Ego te absolvo.* (Miller)

Wind energy has the added handicap that it is produced intermittently and erratically. Therefore, it requires the functioning of other constantly-producing energy systems, such as coal-fired furnaces or other dependable producers. These alternative sources see their efficiency reduced while on standby for the

wind turbines (Le Pair and DeGroot, 2010). The reliance on backup makes it difficult to calculate a “firm” supply cost for wind energy and the savings that it would generate in CO₂ emissions (Hawkins and Hertzmark, 2010).

Also, not all the wind that blows can be used to produce energy: there is a speed range for useful wind and there are wind speed thresholds beyond which the wind is not energy-worthy, either because it blows too strongly or too weakly. Additionally, the peak periods of usable wind production do not coincide with demand peaks and wind-produced energy cannot be stored, it has to be consumed as it is produced or it is lost, so to speak. So, to the intermittency problem, there’s the added disadvantage of a possible unpractical speed and the wrong timing.

Recently, the European Wind Energy Association (EWEA) reported that wind power plants slowed in Europe by about one tenth in 2010, while coal power construction gathered pace, and newly installed wind farm capacity was 9.3 gigawatts in 2010, compared to 10.5 gigawatts in 2009. For only the second time since 1998, the EU installed more coal power capacity than it decommissioned in 2010 (EWEA).

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