

PUBLIC PERCEPTION OF WIND FARMS.

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Summary.

It is common for wind energy companies and governments to claim the public support wind farms. These claims, made from opinion poll data, are contradicted by extensive investigation by environmental economists

Background.

It is a common belief, propagated by generating companies and government officials, that the majority of the public really support wind farm proposals, that they really like turbines and that objectors are merely a minority of NIMBYS. The word NIMBY is an abbreviation of Not In MY Backyard. NIMBYS are assumed to identify people and officials who accept policies but reject it just for themselves for selfish reasons. The discussion here will demonstrate that this belief is incorrect.

The concept of NIMBY is flawed.

When wind farm proposals are made in many European countries they commonly encounter not only strong local opposition but opposition from much further away too and who are not in the 'backyard'. Auchencorth wind farm proposal with which I am familiar is an excellent example. Out of the 2400 or so objections registered with Midlothian Council, only about half actually originated locally from local people. Some even came from foreign countries presumably from people who remembered the particular countryside and were aghast at it being desecrated by 100 metre turbines. 1200 objections from outside the local population does not equate with the NIMBY designation.

In the UK as in many other European countries opposition has seriously slowed the achievement of government targets on renewables. The UK government has thus been led by opposition to land-based wind farms to offer substantial areas of sea-bed to generating companies (with yet higher subsidies again) in the hope of meeting appropriate targets. Whether these targets if achieved are viable for wind energy in terms of grid stability are very uncertain and the uncertainty increases with the higher the degree of penetration. Electrical engineers and those with direct experience of working the grid are highly critical of government targets for renewable electricity (e.g. Laughton, 2005; Sharman, 2006). This hardly sounds like public acceptance.

Opinions obtained by poll or by environmental economics?

In attempting to convince others that there is a large silent majority in favour of wind farms, companies often rely on opinion polls. These are methodologically-weak and unreliable methods of assessing attitudes because they rely on instant responses to the questions posed.

Psychologists recognise that the human brain reacts in different ways according to situation. Instant thought is required in situations that are fast changing. For example, when walking in a crowded street, adjustments in direction continually require to be made; driving a car requires instant assessments. Faced with unfamiliar situations many people suspend their powers of reason and provide instant responses, that they may then regret at leisure. Opinion polls require instant responses passing through at best superficial parts of the thinking process.

In contrast, in rebuttal, this short article has relied on seven detailed (and peer reviewed) investigations by environmental economists and sociologists that have provided assessments of real public attitudes to wind energy. These investigations did not require instant responses but thoughtful discussion over days and weeks and thus are more reliable. Environmental economists give participants plenty of time to consider and indicate their real attitude after debate. Respondents are also asked to detail the amount of money they would be prepared to forgo, to ensure their decision moved forward as policy. Environmental economics investigations provide the necessary time for thoughtful consideration and are thus more revealing of real public attitudes about wind farms in the countryside.

Opinion poll flaws.

The problem with using opinion polls to gain access to real attitudes is virtually any answer can be elicited according to how the question is framed; that is even if the questions asked have been indicated. Furthermore opinion polls requiring instant answers in the street or on the phone fail to provide the necessary additional information that improves deeper thought about the answer. The unreliability of opinion polling has been demonstrated many times.

A commonly used poll quoted by companies and the wind energy association is one solicited from MORI Scotland in 2003 by the Scottish Executive. The disadvantages of polling are abundantly illustrated. Contact was by phone; the questions asked were not indicated (they seemed to have been conversations but for how long is not indicated), there was no attempt to establish that the respondents had any knowledge at all of wind energy and the much higher price of wind-generated electricity that the public pay for. The questioners clearly did not refer the very large profits to be gained by generating companies and landowners alike. They were not asked to indicate costs and benefits; the enormous visual change in the countryside, the impacts on wildlife. Nor at that time was there any reference to the uncertainty of the science over climate change, or the very low level of UK greenhouse gas

emissions. Above all they were not asked so far as can be ascertained the following simple questions;,

- (1). Which would you prefer, a landscape with turbines or a landscape without?
- (2). Would you buy a house a kilometre from a wind farm given the uncertainty of the effects of very low frequency sound on its inhabitants?
- (3). If it was shown that wildlife was damaged by the presence of a wind farm would you still support its construction.
- (4) Do you think that consultation with the public should be properly initiated before any company starts on proposals?
- (5). Would you be more supportive of wind farms if the local community owned them totally and thus received all the profit?
- (6) The respondent should then be shown two pictures of the same house, one with and one without turbines in the background. Then asked which they prefer and to give a valuation of both.

The variety of opinions actually offered in the poll findings were not properly described and although reference is made to some wind farms, we are not given details of the environmental placements of wind farms or the characteristics of any of the wind farms supposedly involved. Finally there was a response rate of 28%. The way the poll was presented in grossly abbreviated (propaganda?) form by the Scottish Executive (government) was almost certainly to try and counteract what was fast becoming an enveloping criticism in the media and objections on the ground to wind farms. Otherwise why bother to solicit an opinion poll if everyone was in favour?

In 2005 Deputy First Minister, Jim Wallace, was forced into issuing this statement. "Reports suggesting the massive proliferation of wind farms across Scotland are simply nonsense. It is true that a large number of applications are in the system but a great deal of these will not meet our stringent planning regulations. These are designed to protect our countryside, wildlife and natural habitats and this is exactly what they will do". As everyone knows and as Jim Wallace almost certainly did at the time, this statement is/was untrue and perverse. There are for example currently 54 wind farms proposed, being built or operating within 30km of Edinburgh. When the statement was made there were less than 30 and they continue to come.

But the statement reflects a common top-down attitude of the political establishment that is almost certainly at the real root of the problem it was trying to countermand. The Scottish government statement illustrates either the lack of comprehension over the central dilemma described below or an unwillingness to listen to the public at large, no matter how loud they shout. In short my assessment of MORI poll (and others like it sometimes solicited by wind energy companies) indicates they are designed to be used as propaganda to put down opposition. Myopia is not uncommon in a political establishment and large companies. These assume that once they have decided on policy the population must be coerced into line; objectors are merely a minority nuisance to be overwhelmed.

A major problem with all renewable energy generating procedures is the very low density of energy collection.

So how many turbines will be forced on us? The chief scientist at the Department of Energy, London is a Cambridge physicist who has published a book "Sustainable Energy without the hot air". (2009) Cambridge University Press and available free on the web. His calculation is that to achieve 10 GW from land-based wind farms will require a third of the land surface of Scotland to be swathed in turbines. Politicians typically ignore such calculations. Each turbine requires at least 20 acres of ground to avoid interactive turbulence, turbulence that is known to kill bats by exploding their lungs. I calculate (and the Chief Scientist agrees) that to provide the 1.2-1.5 GW equivalent of an ordinary power station requires about 1500-2000 turbines at 100 metres high and needs about 300 square miles. (areas near roads, houses, towns, cities etc act as exclusion areas for turbines). All of it unreliably generated. (The turbulence is pictured on the web from the wind farm at Horns Rev in Denmark; type 'Horns rev wind farm pictures' into Google)

The damaging effect of wind farms on wild life (birds) has now been well established by investigations performed by SNH, RSPB and government scientists (Pearce-Higgins et al. 2009). Out of 12 species examined, 11 experienced declines in number of 50% up to 800 to one kilometre from the turbines. The density of bird populations is determined by food supply. If birds are excluded from an area it does not mean higher numbers around the exclusion zone but simply that the excluded die off. The population total declines.

The real public attitude to wind farms.

Wind power needs to be distinguished from wind farms; the two are entirely different in the public mind. When asked about the use of wind power in the abstract, the public is usually strongly in favour. Wind as a source of power is free at source (although not in exploitation) and supposedly green so is supported on that basis. But explicit (and local) proposals for wind farms in defined environments now remove it from the abstract and crystallise and focus attention on the reality of what wind power in the form of a farm actually means to the landscape and to peoples lives.

For example Alvarez-Farizo and Hanley (2002) assessed Spanish opinion on a potential proposal (with mock- ups of the final wind farm) in a well- known region of Zaragoza. Extent of opposition was based on a willingness to pay and averaged about £30-40/household to protect the landscape and wild life of the area considered. Opinion was solicited over the whole of Zaragoza so was not just local. Given the numbers of households in Zaragoza this adds up to substantial sums of money offered by the population to oppose wind farm proposals.

Even wider surveys were provided by others. All regions of Scotland (Bergmann et al, 2006), of Sweden (Ek, 2005), of Holland (Wolsink, 2000)

and Denmark (Ladenburg and Dubgaard, 2007) were surveyed and respondents checked for coverage of the appropriate countries. These assessments of opinion indicated that **nearness to wind farms was not related to strength of objection** although a common feature was the greater reaction by the rural population compared to urban people. Urbanites are much less likely to see wind farms anyway. Scottish opinion strongly favoured off-shore wind farms to those onshore to the extent of £20/household citing absence of landscape impacts being the major driver. The higher price of wind-generated energy was also objected to. All these surveys indicate that NIMBYS are largely a myth propagated by the media and wind energy companies (Wolsink, 2000,2007).

The original NIMBY term was applied to people who formulated policy but refused to abide by the regulation when applied to themselves. How many of us voted specifically for the policy of destroying the countryside? Voting in a government certainly does not mean agreement with their policies come what may.

Similarly Swedish opinion indicated the primary objection was landscape damage but also insecurity in supply and potential noise pollution. The preference again was for off-shore wind farms. Turbines in mountainous areas were considered distinctly worse compared to locations near the coast.

Western Denmark is well-covered with turbines but Danes were willing to pay over £100/household to have off shore wind farms at least 50 km out to sea, i.e. no longer visible on land (Ladenburg and Dubgaard, 2007). In the Wadden area of Holland damage to landscape was the crucial element in opposition to wind farms by the Dutch population; any contribution to slowing global warming was considered irrelevant. Those asked simply assess the applicability and acceptability of wind turbines in terms of visual intrusion and the consequences for the chosen location (Wolsink, 2000, 2007).

A common claim is that once wind farms are erected, people get used to them.;Actually they don't have a choice (except to move away) but certainly people are adaptable; they adapt to prison or to poverty. The density of people in Macao, China is an incredible 48 million to the square mile which few of us would wish to live in but those there have adapted in that they live there without rebellion. But ask the so-called adaptees whether they would prefer the previous situation (no wind farm) to the present. It is clear from the objections what the answer would be.

Governments and companies are the source of the reasons for objection.

There are costs and benefits to every aspect of human life. Solving problems concerning wind farm attitudes requires recognition of that simple fact; In the case of wind farms, the local public can see that they bear all the costs of a destroyed landscape and wildlife destruction. The sole beneficiaries are large avaricious companies and greedy often absentee landowners.

The contrast between public attitudes on wind farms and government policy based on public support for wind power, is one that results from a lack of communication and understanding. It is governments and wind energy companies that have created the dilemma by a belief in the NIMBY concept. NIMBYS are to be over ridden by even more legislation reducing the ability of local populations to protect their environment from despoliation. It will only increase resentment.

Both Wolsink (2000,2007) and Ek (2005) indicate that real (instead of mythical) NIMBYS are extremely rare. The concept propagated by government is indeed a myth and actually the major part of the problem. Wind farms are a visual intrusion and a loss of countryside amenity to all those that use the countryside for recreation and tourism. The only way to help ameliorate the problem for some is to recognise that a loss of amenity should be compensated substantially. Companies should be honest about profits; they are rarely mentioned. The company involved on the Auchencoth wind farm proposal for 18 turbines would have made an estimated clear profit of £ 200 million over the lifetime of the wind farm; the landowner about £5-6 million. Transparency and honesty on this level would help but I have never seen the profit indicated in any wind farm application. Further problems arise because land owners are able to offer their land for wind farm development without any consultation of the effects of such structures upon their immediate neighbours.

Communications from government and indeed large wind energy companies always miss their target when they do not address the real concerns of the people to whom it is directed. Governments and wind energy companies may argue about global warming but this is nothing more than a distant and rapidly decreasing background in the context of the local decisions actually being taken on real renewable projects (Wolsink, 2000,2007).

The solution to objection, collaboration?

Wolsink (2000,2007) points to the difference in attitude to wind farms in Germany where an electricity act does not limit generation to companies but enables many to invest so that compensation can be obtained for amenity loss. Whether the German situation with its enormous numbers of turbines is desirable is however moot, certainly I would not want it here. As both Wolsink (2000, 2007) and Coleby et al (2009) point out no wind farm proposal should be made until there has been adequate public consultation, participation and approval. Then if a proposal is to be made, adequate compensation (i.e. a reasonable share (50%) of the profits) agreed.

Fundamentally the top-down attitude by governments, who clearly like manipulating the levers of power, is the root of the issue. It is necessary to recognise that governments are not going to abandon their perverse policy at present so some form of compromise may be essential. If the decisions were completely in the hands of local communities as they should be, then if they wish to build and live with a wind farm that is their right. Governments should then provide the construction costs with profit on the money loaned. Generally

construction costs are covered after three years of operation. Bottom up is likely to work better and targets might be achieved amicably.. Communities do have the right to control their own future and if the situation continues as at present, direct action may be necessary to make the point to those we elect. The supposition that the public will support whatever planners and industry want them to do, leads also to the simplistic belief that knowledge will change attitudes. It does not.

There is a growing top-down technocratic, hierarchical way of thinking in government about the way plans must be instituted. In compelling local authorities to accept virtually any wind farm proposal ensures companies can put them anywhere they want and leaves the siting random. In short the countryside will be damaged at random. Wind power development in such situations contradicts both the principle of physical planning and the legal protection of the populace. Collaborative processes work much better as has been found in waste power siting in some countries. With proper compensation those that do not like wind farms locally can move away without financial loss undesirable though this is.

Bad communication causes endless problems but it results from the way most decision-making is framed. There should be complete openness in the process and the avoidance of technocratic and corporatist-based, elite, decision making. Consultation only after a plan is instituted is more of a trigger for opposition than an incentive for the design of suitable projects.

References.

Alvarez-Farizo, B and Hanley, N. (2002). Using conjoint analysis to quantify public preferences over the environmental impacts of wind farms. An example from Spain. *Energy Policy* 30, 107-116.

Bergmann, A., Hanley, N., and Wright, R. (2006). Valuing the attributes of renewable energy investments. *Energy Policy* 34, 1004-1014.

Coleby, A.M., Miller, D.R., and Aspinall, P.A. (2009). Public attitudes and participation in wind turbine development. *Journal of Assessment Policy and Management*. 11, 69-95.

Ek, K. (2005). Public and private attitudes towards "green" electricity: the case of Swedish wind power. *Energy Policy* 33, 1677-1689.

Ladenburg, J., and Dubgaard, A. (2007) Willingness to pay for reduced visual disamenities from offshore wind farms in Denmark. *Energy Policy* 35, 4059-4071.

Laughton, M. 2005. power supply security with intermittent sources. In *Platts, Power in Europe*. Issue 460 10th October 2005.

Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P., and Bullman, R. 2009. The distribution of breeding birds around upland wind farms. *Journal of Applied Ecology* 46, 1323-1331.

Public attitudes to wind farms. Mori Scotland. Energy Policy Unit research Findings No.12/2003. Scottish Executive.

Sharman, H. (2005) Why UK wind power should not exceed 10 GW. *Civil Engineering* 158, 161-169.

Wolsink, M. (2000). Wind power and the NIMBY myth: institutional capacity and the limited significance of public support. *Renewable Energy* 21, 49-64.

Wolsink, M. (2007) Wind power implementation: The nature of public attitudes: equity and fairness instead of backyard motives. *Renewable and Sustainable Energy Reviews* 11, 1188-1207.