Campaign to Protect Rural England
NORTHAMPTONSHIRE

WINDFARMS
TIME TO CHANGE DIRECTION?

Introduction

When the CPRE was founded its original purpose was to protect the countryside from uncontrolled development. Now its remit includes support for the rural economy and environmental measures that sustain the countryside.

Windfarms are contentious locally. But climate change and anthropogenic global warming have caused CPRE nationally to come to the judgement that, although large scale windfarms cause an industrialisation of the countryside, this is acceptable, in order to avoid the damage to the environment caused by not generating renewable electricity. As a result CPRE national policy has been to support the development of windfarms provided that they were not sited in our most valued countryside.

Since that original policy was formed, new evidence has come to light to suggest that the generation of electricity from wind is not an effective method of reducing carbon emissions. As a result the balance of the argument has changed and we believe it is now appropriate that CPRE should re-evaluate its support for onshore windfarms. In view of the rapid proliferation of onshore windfarm proposals across the country the need for that re-evaluation is urgent.

Follow this link for a two page Executive Summary of this report.

Supply in the UK

Balancing Supply and Demand

Uniquely among the large-scale sources of energy required in the UK there is as yet no economic way of storing electricity – if it is needed it must be produced instantly, and if it is produced it must be used. As a consequence the supply of electricity has to be matched, almost instantaneously, to demand. It is a key function of the National Grid to manage this process, calling power plant to run, often at very short notice, to meet a surge in demand (at the end, for example, of popular television programmes!) and to stand down plant as their output becomes surplus to immediate demand.

The demand for electricity fluctuates across the country continuously. To some extent the demand is predictable – about 40% is continuous ("Base Load") throughout the year, powering public services, infrastructure and industry. Within broad limits the rest of the demand can be anticipated – greater in the winter than the summer (despite increasing use of air-conditioning in cities); greater by day than at night; greater in mornings and evenings than in the middle of the day. But the lack of storage requires a minute-by-minute management of the available power capacity, with adequate resource ready to be called to run, or to be stood down, at very short notice.

In the past the Grid has been greatly assisted in the balancing function by the relative predictability of power plant availability: a modern gas-fired plant can be expected to be technically available for an average of over 90% of the year. Part of the down time is due to scheduled maintenance and part (about 3%) to unscheduled outages. To cover these gaps the system has traditionally maintained a margin of about 20% in installed power plant capacity over anticipated peak demand ("Planning Margin"). And the power plants in the UK have been traditionally built on a large scale, close to the fuel sources such as coal fields, and/or close to the high tension power grid which was designed to move the power out across the country to the centres of demand.

The analysis of the UK power sector demands a clear understanding of the distinction between the capacity of a power plant to deliver output (usually expressed in megawatts – Mw) and the quantity of power which is delivered from it (megawatt/hours – MwH). The analogy is between the horsepower of a car and the frequency and distance it is driven. While a gas plant will supply power for over 90% of the year, an onshore windfarm in the UK may aspire to reach 30% but, according to records, is likely not to exceed about 20%.

The introduction of renewable energy in the UK on a large scale will very significantly affect the way in which power is supplied and the balance with demand managed. As such, renewable energy is not new in this country – over 10% of electricity demand in Scotland is met by hydro power. But new sources such as wind, land fill or bio-mass are in relatively small units, scattered around the country. These need to be connected to the national or regional power grids. And some sources, wind power in particular, are inevitably unpredictable. At the present time wind power supplies less than 2% of total UK demand. At this level it represents an important, costly, but still manageable burden on the Grid.

Were the targets set by Government to be achieved, in terms of output from installed wind power, onshore and off-shore, the National Grid would have to be able to manage a wholly new dimension of supply/demand balancing, standing down operating plant on a large scale to accommodate wind production as and when it arose, and, conversely, calling large plant to run, often at inefficient levels, to take up supply when wind production falls away. It is already having to plan a radical reconfiguration of the power grid to accommodate the inflows of intermittent wind power from the remoter parts of the UK as and when the major off-shore windfarm projects are realised.

Security and Economics of Power Supply

In the debate about renewable energy the subject of supply security is often discussed in terms of the "Back-up" power needed to support wind capacity. More properly, it should be described as a system which is able to meet all foreseeable power demand as it arises and, at the same time, has to permit, regardless of cost, the substitution of efficient plant by the intervention of wind power as and when the wind conditions are appropriate to permit power production. These conditions may occur at any time of the year, of the day or night, or within the day, and they can have no bearing whatever upon the fluctuating levels of power demand in the country.

The production and supply of electricity in the UK are separate businesses, each organised on a competitive basis and regulated by licence. There is now no statutory obligation to supply power to any customer, although penalties may arise if a failure to supply results from a breach of licence or contract obligations.

The balancing of supply to demand was conventionally managed in the UK by calling power plant to run on a "Cheapest-first" basis (a merit order, based on marginal operating costs). The intention was that the most expensive plant would only be called to run when demand was at its highest. In practice this has often been distorted for policy reasons – in the past nuclear plant in the UK has had a privileged position, for example, due to its inherent inflexibility of operation.

The UK supply business is now based on market principles – power stations contract to supply specific quantities of power to the supply companies in half-hourly periods. If they generate power in any half hour which has not already been contracted the power will be purchased by the Grid at distressed prices; if in any half hour the supply companies take power they have not already purchased or generators fail to deliver power they have contracted to supply, they will be charged a penal price by the Grid for it. The Grid balances the system by contracting to have plant on standby.

The security of the system has been eroded in recent years as demand has risen without new plant being built, against the background of ageing coal and nuclear capacity. This has been exacerbated by uncertainty surrounding government policy towards new nuclear plant. It is set to become still greater as EU regulation demands the retirement of much coal-fired capacity and the delays in clarifying UK nuclear policy point to the possibility of a shortfall in base load capacity within 5 years or so.

What is certain is that a very substantial investment is urgently needed just to replace existing capacity and meet the forecast growth in power demand. This investment is essential, regardless of – and additional to - the question of increasing renewable capacity, and the costs will be very significantly inflated, primarily because of the intermittent and particularly unpredictable nature of wind power which demands the availability of duplicate conventional power capacity.

The de-carbonising of the UK power sector is a valid and worthwhile objective, as the costs and security of imported fuels – gas, coal, and nuclear feedstocks – become strategically sensitive, quite apart from all the environmental and climate-change issues relating to them. But the true, transparent costs of superimposing intermittent renewable energy, on a large scale, on the UK power sector should be tested on a cost/benefit basis which considers all options, including other renewable technologies, and the scope for large scale reduction in overall energy demand which would assist in achieving an absolute reduction both in the costs of energy and in carbon emissions in this country.

Windfarms and Carbon Reduction

When the original CPRE policy was framed, it was officially accepted that each kilowatt hour (kWh) of electricity generated by a wind turbine would prevent the emission of 860g of carbon dioxide from a fossil fuelled power station. However, since that time it has been accepted that this is not the case, because the premise for calculating this level of carbon offset is deeply flawed – that wind power could exclusively replace the most carbon-intensive electricity generation with 100% efficiency. It is now clear that this best-case scenario was never either realistic or achievable.

From the outset the statistics used when calculating the carbon savings from wind have been based on long term averages – average output from the windfarm, and average use by consumers. Unfortunately, our use of electricity does not take place at a steady rate and even a large fleet of wind turbines will never produce a steady level of output, or one which has any relationship with the pattern of power demand. In short the statistics currently in use bear little relationship to real world conditions and do not model the true carbon-saving potential.

Our demand for electricity is fairly predictable and is governed by the different cycles that affect our lives and by the prevailing weather conditions. The factors that feed into demand are well known and demand can be predicted with a reasonable degree of accuracy. The output from wind turbines, on the other hand, is highly variable in both the short term (because every change of wind power or direction can suddenly de-power a windfarm) and the long term (because it is dependent upon the prevailing weather conditions).

Unfortunately, most of our electrical appliances require that the electricity supply should remain within very limited tolerances. Thus it is necessary to control the overall output from all power stations in order to ensure that the grid remains in balance at all times. The use of wind generated electricity in the grid makes this difficult and introduces significant carbon costs that are not accounted for in the current statistics.

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The factors that come into play are:

1. lack of dispatchability
2. selective displacement of coal
3. spinning reserve
4. embodied energy
5. backup power stations

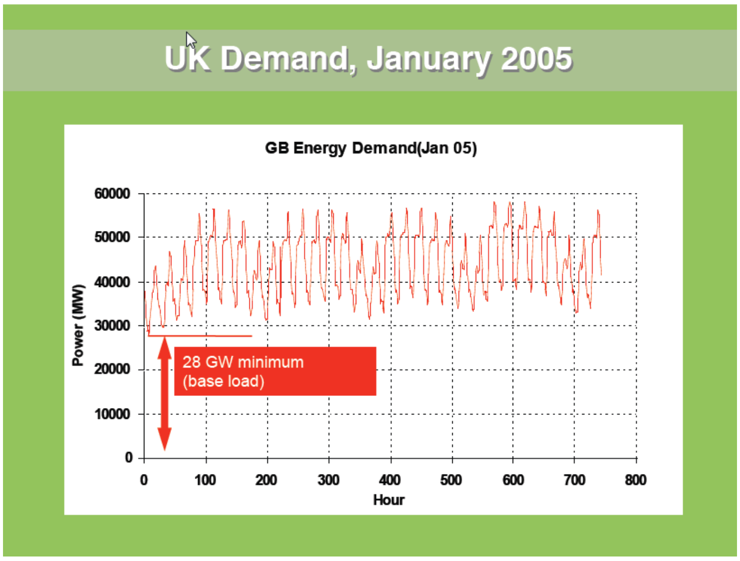
Each of these factors in their own right significantly reduces the carbon savings that can actually be achieved by generating grid electricity with wind power stations. In combination they call into question whether the carbon savings from wind warrant its adoption as the main vehicle for reducing carbon emissions in the electricity generating system.

Lack of Dispatchability

The ideal power source in a supply system like the National Grid is one which is dispatchable – that is one which can be called upon when needed to meet demand and kept in reserve at other times.

The key weakness of wind power is that there is no control over when electricity is produced or how much output there will be. Turbines produce electricity when it is windy and, beyond narrow limits, the amount of electricity that they produce is determined by the strength and consistency of the wind. Although it is possible to shut down or reduce the output of a wind turbine, it is not otherwise possible to control output.

Our demand for electricity conforms to a fairly predictable pattern that matches the rhythms of our lives. In the diagram below it is possible to see both the daily and weekly cycles of use:



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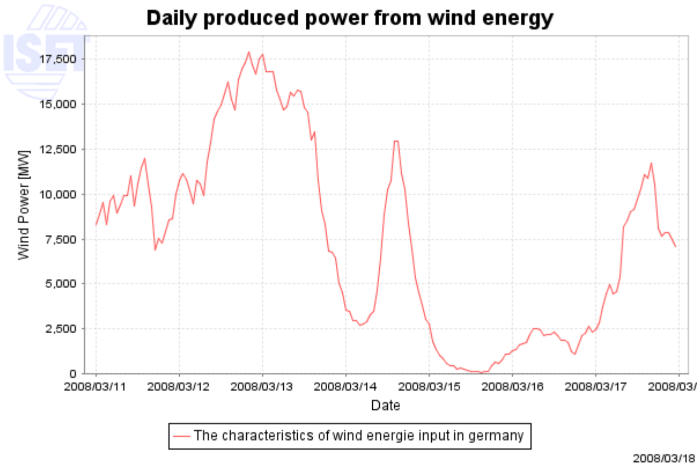
The output from even a large fleet of wind turbines (such as they have in Germany) can be very variable:



It is clear that there is no correlation between output and demand and that there can be periods of low demand but high output and vice versa.

The well known consequence of this is that there will be times during which the combined output from wind will be very small. A House of Lords report[1] has acknowledged that wind power has "a very low capacity credit" which means that it can make only a very small contribution to reducing the number of power stations that are required.

A less known consequence of the lack of dispatchability is that with a large fleet of turbines (such as proposed in the Government's UK Renewable Energy Strategy) there will be times during which the output from windfarms will exceed demand. This has already occurred in Spain[2] whose contribution from wind is significantly lower than that proposed for Britain.

Given that the UK strategy is to generate 40% of our electricity from wind and that wind turbines on average generate less than 30% of their rated output, this requires the installation of turbines that have a rated capacity of over 130% of national average consumption. In this situation it is clear that at times when there is low demand and good wind speeds the output from the wind turbines alone will exceed national demand. When you also consider that our zero-carbon nuclear power stations will already be supplying a significant proportion of this demand, it is clear that under these circumstances some windfarms will need to be disabled.

Selective Displacement of coal

The original 860g carbon offset figure was based on the assumption that wind power could exclusively displace coal powered generation. Much though it would be desirable from a carbon reduction point of

[1] House of Lord, Economic Affairs - Fourth Report: The Economics of Renewable Energy, 12 Nov 2008
http://www.publications.parliament.uk/pa/ld200708/ldselect/ldeconaf/195/19502.htm

[2] http://www.reuters.com/article/idUSTRE5BT2K620091230?feedType=RSS&feedName=GCA-GreenBusiness&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+reuters/USgreenbusinessNews+(News+/+US+/+Green+Business)&utm_content=Google+Reader

view to be able to turn down or turn off our coal-fired power stations when windfarms were generating electricity this is neither practical nor commercially viable.

Coal fired power stations can not be rapidly started or stopped because the boilers have to be brought up to temperature or cooled down. This has been officially recognised and even the BWEA (the wind industry trade body) now recommends that an offset figure of 430g/kWh should be used based on the grid average emissions. It has also been recognised that the grid average emissions will reduce over time as the electricity generation system becomes more carbon-efficient through the introduction of renewables, an increase in nuclear capacity, the introduction of more efficient fossil fuelled power station and the adoption of carbon capture and storage.

In the short to medium term it is possible that the incorporation of wind into the grid could actually increase the proportion of coal in the energy mix. This is because the lower-carbon gas fired power stations will be kept in reserve to be used to balance the grid and so the slack will have to taken up by other sources such as coal.

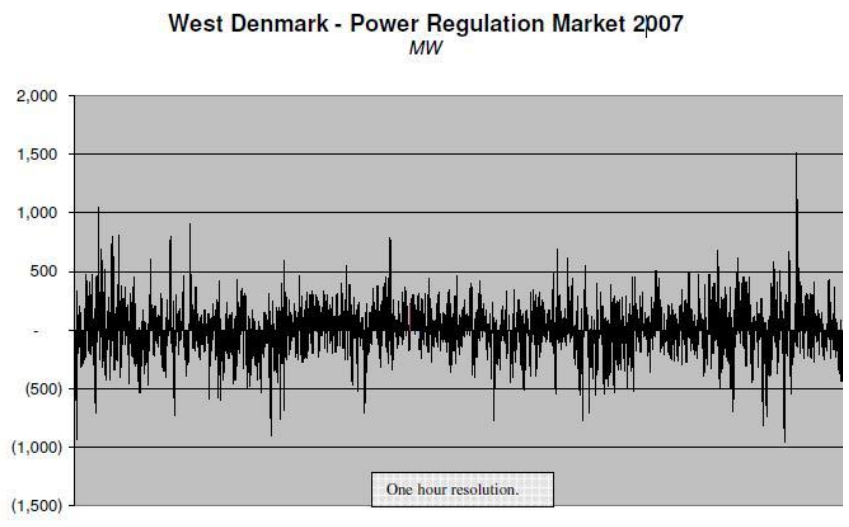
Backup Power Stations

Because of the lack of dispatchability discussed in a previous section, it is necessary to have back-up power stations that can fulfil demand when there is insufficient output from windfarms. If these can actually be shut down then fuel can be saved. However, if some output is needed, then because they are normally designed to be run at full power, then their efficiency is compromised.

Another more minor carbon cost of backup power stations is that when they are not in use, they are not repaying the embodied energy expended in their creation, and, in economic terms, their capacity is "Stranded". To compound this, their life is reduced by the stress and fatigue caused by the additional heating and cooling cycles – thus increasing this hidden carbon cost.

Spinning Reserve

Where backup power stations fill the longer term shortfalls in output, spinning reserve is needed to smooth out the short term fluctuations in the grid. The output from even significant numbers of wind turbines can fluctuate rapidly as is illustrated in the diagram below:



In order to prevent power dips and surges that would damage our electrical appliances, conventional power stations are run in spinning reserve whereby they are kept on tick-over ready to be fired up rapidly when the power dips. In this mode they are very inefficient and so carbon-intensive.

Embodied Energy

A significant amount of carbon is emitted in the process of creating a windfarm. Not only do the turbines have to be manufactured and transported to the site, but large amounts of concrete and crushed stone are used in the construction of the turbine bases, trackways and crane pads.

The proportion of embodied energy to output for a windfarm is much greater than for more conventional power stations – so much so that, even when using the 430g carbon offset, it can take years to repay the carbon debt incurred during construction. It has been argued that the embodied energy for some windfarms will never be repaid.

Net Effect on Carbon Offsets

When each of the above factors results in a significant reduction of the carbon savings that can result from the use of wind generated electricity in the grid, it is clear that even the 430g/kWh figure for carbon offsets is unrealistic. Given that windfarms are at the heart of the Government's policy to reduce carbon emissions it is astounding that more effort has not been expended in establishing a realistic carbon offset for wind.

Although it would be possible to build a model that would reflect the impacts discussed above, there is less benefit from doing so than can be derived from examining real life data. The early adopters of wind are now producing data that can be used to evaluate the net benefits based on practical experience.

Denmark generates 19% of their electricity from wind. Unfortunately there has not been a significant reduction in the consumption of fossil fuels in their electricity generation industry as a result. It would appear that in Denmark the carbon offset for wind is very low indeed. There are of course differences between the Danish and UK electricity generation systems and so a direct comparison is not entirely appropriate. For example, Denmark has a higher proportion of combined heat and power plants (CHP) that pipe the excess heat from power stations into homes and businesses rather than wasting the heat in cooling towers. This is of course much more carbon efficient, but it reduces the opportunities to shut down the CHP power stations.

However, a probably more important factor is the arrangement that Denmark has with their Scandinavian neighbours who have large hydro-electric reserves. The agreement allows the Danes to balance their grid with rapid-reaction, zero-carbon hydro and to feed back ("Spill") excess power from wind to their neighbours when there is a surplus. This is tremendously important in reducing the carbon costs of balancing their grid.

On balance, it is unlikely that the UK system can match the carbon performance of the Danish system because not only is there very little stored hydro to balance the grid, but there is not the opportunity to build the capacity that would be needed for the purpose.

In short, any net carbon reduction from the use of wind is likely to be very low.

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Landscape Impacts

Renewable energy projects are rightly a key feature in dealing with energy demands while addressing concerns for climate change. Wind power has emerged as a particularly prominent technology made manifest by the widespread promotion and development of windfarms both onshore and offshore. This section of the paper considers the development of onshore windfarms and specifically the criteria currently applied when considering the appropriateness of any particular scheme of proposals in relation to their impact upon the rural landscape.

Industrial scale wind turbines are massive, moving structures quite beyond the norm as regards the scale and impact of other structures in the countryside. They are simply utilitarian in design engineering terms and because they are usually planned on high level, wide expanses of open countryside and particularly ridgelines, they inevitably dominate the landscape over a wide area. Further the infrastructure of access roads, substations, foundations, cable routes and so forth in effect 'industrialise' an area that hitherto has been deemed wholly rural. These factors make windfarms particularly difficult to integrate into any landscape and national planning policy has been framed with this in mind.

PPS22 and PPG22[3] are the principal documents that set the framework for local planning authorities (LPAs) to determine windfarm applications. These indicate that local planning policy should actively promote renewable energy developments and not seek to restrict such and further that LPAs should not make assumptions about the technical and commercial viability of such projects. PPS22 indicates that whilst issues of landscape and visual impact should be addressed at the scheme-specific level, LPAs should recognise that the landscape and visual effects will only be one consideration to be taken into account. Landscape must be considered alongside the wider environmental, economic and social benefits that arise from renewable energy projects.

Albeit the Companion Guide to PPS22 does promote an objective approach to considerations of landscape and the visual impact of windfarm developments with specific references to landscape character and sensitivity and to the cumulative consequences of any specific proposal or group of proposals, such are not deemed the priority. Further the East Midlands Regional Plan[4] contains the statement that 'much of the Region could be suitable for the location of wind turbines subject to a number of criteria including visual impact and the cumulative effect of a number of turbines and their actual size.' The inference is clearly that a favourable approach towards windfarm developments should be adopted.

This approach has in some measure helped in the creation of a *laissez-faire* approach to developments. Promoters are encouraged by generous subsidy provisions to offer lucrative deals randomly to landowners to accommodate wind turbines in the rural landscape. In many cases this is done with little regard for the appropriateness of a particular location. Planning and appeal decisions have reinforced the impression that issues of landscape and visual impact are not given priority. Both developers and, to some extent, Planning Inspectors have only considered nationally designated landscapes as worthy of preservation.

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[3] Planning Policy Statement 22, September 2004 and Companion Guide to PPS22, December 2004

[4] East Midlands Regional Plan adopted in March 2009

Today our perception of the English countryside is still much influenced by Ruskin's aesthetics and ideals born out of the Romantic Movement of the early nineteenth century. It is suggested those aesthetics and ideals still in principle remain wholly valid and the protection of the unique rural landscape that is our inheritance must be and remain a paramount objective of those concerned for the English countryside. Panoramic views and vistas are integral to unique rural settings and highly valued. Features of cultural and historic importance in the rural environment are also a vital consideration. Church towers and spires, country houses and ancient monuments, parklands all exist within unique settings and these would be clearly compromised by wind turbines permitted within even moderately remote proximity.

It is acknowledged that much of the landscape is not in a state of nature but rather created by the time and effort of its occupants. Most of the landscape has been distinctively shaped by the passing generations to give it today its unique character. Change has taken place and change is indeed an on-going phenomenon generation by generation. It is the proper management of necessary change that is vital to prevent an unacceptable aesthetic price being paid for what at any given time is deemed progress.

Much is made of the temporary nature of windfarms. However, even Planning Inspectors have acknowledged that this is disingenuous. Not only does the usual 25-year permission represent a significant proportion of the expected lifetime of the population, but it is almost inevitable that, unless there is a radical change in policy, a new permission will be sought to re-power the site in order both to capitalise on the considerable infrastructure investment and to maintain a profitable electricity supply business. Once a windfarm is established it is likely to become effectively, a permanent feature of the landscape.

Where sites are not re-powered at the end of their permission, or where they cease operation, it is essential that they are not left to decay in the landscape. Most individual windfarms are constituted as an independent limited company and so it is possible for that company to be drained of funds before the end of the planning permission leaving insufficient funds for the company to meet its decommissioning obligations. Thus it is essential that all permissions should be contingent on the provision of a financial instrument or insurance that guarantees that the windfarm will be decommissioned. It is also important that the land taken by the windfarm should be returned to its former use, and not designated as "Brownfield" for future development purposes. Many planning permissions only require a limited reinstatement which will result in the affected land being less productive than it was before it was developed. This practice should be discontinued in the interests of future agricultural security.

Little seems to have been learnt from past mistakes. The rapid implementation of the National Grid has left pylons littering the landscape even though it was thought, when they were installed, that these would be a temporary measure in protected and valued landscapes. This clearly demonstrates how an urgent quest for a specific goal, if blinkered in approach, can result in permanent damage to the environment - in particular to the open countryside. Solutions to strategic developments such as the renewable energy agenda where there are clear social and economic benefits must be accompanied in parallel by solutions that mitigate or compensate for adverse environmental impact.

The sheer scale of wind turbines inevitably compromises any rural setting. They affect the perspectives of distance and topography in the open countryside. By virtue of their size the turbines now being produced (measuring more than 400 feet above ground level) simply do not fit into the landscape but constitute a lasting and material change to the nature of any given landscape.

With windfarms involving both small and large numbers of turbines the issue of 'location' is of major importance if the proper and reasonable protection of the rural landscape and indeed of rural communities is to be secured. The number and size range of turbines proposed for any windfarm must be subject to the closest scrutiny as regards location and possible cumulative impact In order to judge whether the proposal would have a detrimental effect on any particular locality or on any amenities that should clearly be protected.

Issues of landscape awareness and visual impact in Landscape Character Assessments must be given priority in considering any windfarm planning application. Landscape Character Assessments can also inform wider spatial planning by determining suitable dedicated areas where turbines would have lower impact. Within Northamptonshire, for example, this may be in the landscapes already affected by the particularly large scale logistics/warehouse developments.

Issues of landscape, visual impact and a wider spatial planning should henceforward be raised as the primary issues for consideration.

Socio-economic Impacts

Because of the density of the settlement of England, many of the proposed onshore industrial scale windfarms are in the tranquil open countryside between rural settlements. Industrial-scale windfarms transform this environment by the introduction of very large moving industrial machines that emit noise and can produce shadow flicker.

There are three ways in which this has an adverse socio-economic impact. First, the residential amenity of homes near to windfarms can be significantly decreased. Second, rural businesses that market themselves on the basis of their tranquil rural setting lose their USP. Third, the amenity value of the countryside on and near to the site is reduced.

One of the key factors in all three impacts is noise. At the time of the University of Salford report on Amplitude Modulation there were noise complaints at 1 in 5 windfarms. A recent report in the Daily Telegraph (13 Mar 2010) found that at least 1 in 6 of the 255 windfarms in Britain have received noise complaints, but that it had not been possible to pursue the complaint due to the intermittent nature of the problem.

Despite there being ample evidence that the measures intended to offer protection from noise nuisance are inadequate, CPRE Devon discovered that the Government had suppressed recommendations that acceptable noise levels should be reduced. Furthermore the wind industry has recently adopted a new noise modelling scheme that predicts lower levels of noise than the already failing noise model.

Another common issue is the impact on equestrian businesses and equestrian access to the countryside. Many applications do not adhere to the PPS22 recommended safety distance of 200m from bridleways (the BHS recommendation at the time that PPS22 was framed) and almost none respect the more recent BHS recommendation of three times turbine height or four times turbine height for national routes. This makes it undesirable if not dangerous to use the bridleways that pass near to or through the windfarm site. Several applications in the county have been considered to be so dangerous for horse riders that the BHS has expressed the view that the affected bridleway would be effectively closed.

Conclusions and Recommendations

We believe that it is becoming increasingly evident that wind power generation onshore in the UK is failing to live up to its promise. Any environmental good from carbon savings is a fraction of that suggested by the wind industry and the very modest quantities of electricity produced are of limited use. Furthermore it imposes a disproportionate burden on the rest of the electricity generation network in terms of both economics and operational efficiency. At the same time, windfarms and the power networks required to connect them into the grid are very destructive in terms of the landscape, lasting environmental damage, intrusion and even harm from noise.

To justify the long term blighting of unique landscapes and unspoilt rural communities wind power would have to be able to make an incontrovertible case in terms of the contribution it makes to the de-carbonisation of the economy and the security of energy supply in this country. The issues outlined in this paper and supported by real life data from early adopters of wind power make it clear to us that the wind power sector in the UK can do neither of these things.

The UK must soon replace a significant proportion of its electricity generation capacity. Almost all conventional, coal-fired capacity will be forced by EU law to close in the mid-term, and much nuclear is approaching obsolescence. Because wind power is inherently and unavoidably an intermittent and unpredictable power source it has to be backed up almost entirely by conventional generation. As a result wind can offer almost no contribution to the replacement process. On the contrary, because wind power is given priority in the grid, it introduces uncertainty in levels of demand for the output of new conventional power stations and compromises the economic case for companies considering building such new conventional power stations.

In the UK the onshore wind power load factors – the amount of power produced in a year from a unit of capacity – rarely exceed 20%. (Modern gas-fired plant will expect to exceed 90%, and most of the shortfall is predictable maintenance). To approach the output targets (as opposed to installed capacity) projected by government this country would have to be carpeted with windfarms from end to end – and the availability of the output would still be unpredictable. Furthermore the erratic pattern of electrical supply from wind power would still bear no relationship to the pattern of demand.

The current government policy for the encouragement of renewable energy, in the form of selective grants and, more importantly, the ROC scheme is, we believe, inappropriate for wind power onshore in the UK. The ROC scheme, guaranteeing that an artificially high price for electricity is paid to the operators, ensures that windfarms are extremely profitable for developers and operators – even at very low levels of productivity. The disproportionate profitability of onshore wind is inhibiting diversity in renewable technologies. Furthermore, the additional costs pass through to all electricity consumers and these will increase as the proportion of renewable electricity increases. This is, in effect, an involuntary and regressive form of taxation. Yet it is one which, in the case of onshore wind power, serves no purpose in the public interest. The increased electricity costs could also become a disproportionate burden on British industry and threaten its competitiveness in world markets.

It is clear to us that wind power is not the panacea that will provide cheap, carbon-free electricity and deliver us from the effects of climate change. Instead, it provides electricity that is expensive and difficult to use effectively, it compromises the efficiency and economics of other generation methods and it is harmful to the landscape, the quality of life of rural communities and the local environment.

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We recommend that CPRE as an organisation should now withdraw its qualified support for onshore wind.

In addition CPRE should lobby the government for

a) an independent cost/benefit analysis of onshore wind energy production and the present system of subsidisation by the ROC mechanism, taking into account the impact of that production on base load efficiency, carbon emissions and the full environmental and economic impact of wind turbines and grid reinforcement;

b) the imposition of an immediate, temporary moratorium on new onshore windfarm construction within 2km of residential dwellings;

c) an immediate review of the subsidies for onshore wind projects to address their disproportionate profit levels compared to other renewables;

d) measures requiring developers to provide adequate financial and licence guarantees to ensure that redundant wind turbines are decommissioned and the land restored without cost to the public; and

e) action to prevent redundant or inoperative windfarms from being classed as brownfield sites, available for housing and other development.

The government should also be urged to

f) improve the protection of residents from noise;

g) commission independent studies into the issue of blight;

h) commission independent studies into possible health effects of living near windfarms; and

i) allow communities to have a say in where windfarms would be appropriate, rather than have opportunistic developments imposed upon them.

In terms of addressing the challenges of decarbonising the economy, we believe that the government's focus should turn towards reducing the carbon emissions from conventional power generation; the encouragement of renewable technologies which do not have a destructive environmental impact; and bringing about a real and substantial reduction in overall energy consumption.

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July 2010