

## **Onshore wind Q & A**

### **Why do we need onshore wind?**

We need to move from finite, high-carbon fossil fuels to clean, secure energy. No individual technology will provide the silver bullet – our energy mix will have to become increasingly diverse. As part of that mix, onshore wind will have an important role to play.

### **Why is the government focusing on wind rather than other renewable technologies?**

Onshore wind is one of the more cost-effective and established renewable technologies. Studies indicate that the UK has the best wind resource in Europe, and of course the wind itself is a free and unlimited source of fuel, so it protects consumers against the volatile but generally increasing cost of fossil fuels. It's also reliable – the likelihood of low wind speeds affecting 50% of the country occurs less than 100 hours per year. The chance of turbines shutting down due to very high wind speeds is very low.

But it is not the whole solution, just part of it. As well as onshore wind, we want to see large expansions in both offshore wind and bio energy, alongside new nuclear without public subsidy and carbon capture and storage.

### **Why is the Government subsidising wind farms?**

Generating electricity from renewable technologies is more costly than from long-established fossil fuelled technologies. As part of EU-wide action to increase the use of renewables energy, the UK has committed to generating 15% of our energy from renewable sources by 2020. If we are to meet this challenging target, appropriate support needs to be provided to these technologies to ensure that they are viable.

### **How do you make sure that subsidy is not paid to windfarms that aren't generating/aren't efficient?**

The Renewables Obligation (RO) is currently the Government's main financial incentive for renewable electricity. It is a generation based subsidy meaning support is granted for each MWh of electricity generated, so a wind farm will only receive

support when it generates. Lower capacity windfarms will generate less renewable electricity and receive a lower RO subsidy.

It is also important that wind turbines should be positioned where the wind resource is strongest. So this year we are bringing forward a full review of the funding mechanism, so we can ensure that subsidies will not make it attractive to put windfarms in unsuitable locations. Onshore wind is by far the cheapest large-scale renewable energy source and without it, our electricity bills would have to go up. But the funding mechanism must reflect reductions in costs.

### **How much is the RO adding to electricity bills?**

Suppliers tend to pass the associated cost of complying with the RO onto their consumers. Ofgem, who administer the RO scheme, estimated that in 2009/10 this added around £12 to the average annual domestic electricity bill. Increased costs paid by all consumers must be weighed against the long term benefits of renewable energy, which will include increased security of supply, mitigation against climate change and improved air quality.

### **Aren't wind turbines inefficient given the intermittency of wind?**

Wind turbines tend to generate electricity for around 70-80% of the time, but wind speeds vary and this has an impact on how much power is produced. This is taken into account by developers when considering new projects. Sometimes we see a period of a few days when turbines produce comparatively little electricity. As we increase our wind generation capacity, back-up will increasingly be required. However, in future, the impact of intermittency on the system will be further reduced through better demand management and through storage, and pump storage and hydrogen or battery technologies are coming through at an impressive rate.

In 2009, the average 'load factor' for UK onshore wind turbines was 27% (it was 34% for offshore turbines). The load factor is a proportion of the maximum theoretical output you could get from a wind turbine over a period of time. So, a very high load factor would be when the wind blows consistently *and* at high speeds. Obviously wind speeds vary and this has an impact on how much power is produced. If you look at fossil fuel powered plants, the average load factor across 2009 was about 50%, although this is partly due to fluctuations in demand. However, the comparison is somewhat misleading. The fuel source for wind, contrary to fossil fuel power

plants, is limitless and free so when you take this into account wind turbines are actually more attractive than the load factor might suggest.

### **How much electricity do wind turbines actually produce?**

In 2009 – when we had fewer turbines than we have now – wind power produced over 7.5TWh, which is equivalent to the annual consumption of over 1.6 million homes. By 2020, wind turbines could be producing four or five times as much as they do now in total. As technology improves, the amount of power per turbine may also increase.

In the third quarter of 2010, wind power produced 3.5% of the electricity we used. However, we'd expect this to be around 20% by 2020, with about a third of our electricity coming from renewable sources.

### **How much carbon do wind farms actually save?**

Wind turbines save carbon emissions by displacing carbon emitting fossil fuel generation from our electricity supply. DECC estimates that the net savings from wind power in 2009 were 5.5 million tonnes of carbon dioxide.

Wind turbines do cause some carbon emissions, but they are extremely small relative to fossil fuel power plants. Electricity generated from wind power has one of the lowest carbon footprints, compared with other forms of electricity generation. As with other low carbon generating technologies, nearly all the emissions occur when the turbines are made, put up and taken down. These account for 98% of the total life cycle of CO<sub>2</sub> emissions, even though wind turbines will generate electricity for 20 to 25 years.

### **What is the government doing to ensure that communities benefit from hosting a wind farm in their area?**

The government is working to create a new relationship between wind farms and the communities that host them, as we believe communities should be rewarded for the contribution they are making to wider society. As part of achieving this, the Coalition Agreement announced that local authorities in England, on behalf of individual communities, will be able to retain the business rates generated by renewable energy developments. We also support the new Community Engagement Protocol

recently announced by RenewableUK  
(<http://www.bwea.com/media/news/articles/pr20110216.html>).

We will also introduce neighbourhood planning and neighbourhood development orders through the Localism Bill. This will enable communities to draw up neighbourhood plans to shape development in their own locality and permit development without the need for planning applications. Under neighbourhood planning local communities can help shape their own low-carbon future

### **What economic benefits does onshore wind bring?**

Onshore wind brings substantial wider economic benefits to the country. A survey published in January 2011 by Renewable UK concluded that around 10,800 full-time employees were working on renewables at the start of 2010. 56% of these are associated with large-scale onshore wind, 29% in offshore wind, 7-8% in small-scale wind and same in marine.

There are an increasing number of companies around the UK involved in manufacturing turbine components and installing, operating and maintaining turbines. This is creating jobs which can often be sourced locally to a development. For instance, Converteam in Rugby is a Power conversion engineer for wind turbines (including onshore), and Nexgen in Stroud is a designer, manufacturer and supplier of wind monitoring masts. These are just two of a number of companies benefiting in business terms from the UK's onshore wind industry.

### **What is the government doing to ensure that wind farms are sited correctly?**

Wind farms have to be located to make best use of the available resources. It is essential that the needs of the local community are met as well. Every planning application is considered on its merits, taking into account advice from statutory advisers on issues such as environmental impact and radar. Projects submitted to the IPC must demonstrate that they have gone through a rigorous process of discussing plans with local communities. We are making changes through the Localism Bill to introduce similar provisions for projects submitted to local planning authorities, and will be consulting on the details of which kinds of development are included.

The National Planning Policy Framework will enable local communities to set their own growth agenda according to local needs and to plan and manage development to deliver this agenda.

### **Why hasn't the government introduced a mandatory separation distance between wind farms and housing?**

The Government is keen to avoid a 'one size fits all' approach and considers that these impacts are best assessed on a case by case basis so that local factors can be taken fully into account, regardless of whether applications are dealt with at national or local level. Where applications are dealt with at local level, we believe that local councils should have the opportunity to decide these matters on behalf of their local community, in the first instance.

### **Don't wind farms ruin the landscape?**

We realise that people are concerned about the visual impacts of wind farms, and it is important that they are sited correctly. However, changes to the landscape happen all the time, and wind farm developments can often become part of it quite readily. Some people find wind turbines aesthetically pleasing, and studies have also shown that people living within 5km of a working wind farm are among the most positive about wind energy.

Wind energy developers generally avoid the most sensitive landscapes, such as National Parks and Areas of Outstanding Natural Beauty. They are also required to carry out assessments of the landscape and visual impact when preparing planning applications.

### **Don't wind farms damage the local environment?**

Wind turbines can have ecological impacts, and the extent and type of impact depend on the site in question. Factors such as the access road extensions or amendments required, the number of turbines and the foundations required, the surrounding land uses and the current levels of biodiversity are all specific to each development. Potential effects of working turbines also depend on the specific development. However, they do tend to relate more to species on the move than to habitats.

Good planning can help reduce any adverse effects. Examples include a habitat management plan (before work starts), and the presence of an ecological officer (during construction and decommissioning). More broadly, UK laws require wind farm developers to undertake rigorous Environmental Impact Assessments, informed by consultation with statutory consultees. For commercial scale wind farms, these often take at least a year to produce. They must be taken into account by planning authorities in deciding whether or not to give consent for any development.

### **Do wind turbines kill birds?**

Data collected from a number of wind farms have indicated that for the majority of wind farm locations there is little or no evidence of a significant impact on birds. However, careful site selection is still extremely important to avoid potentially significant impacts. The RSPB has noted in its own reports that 'the majority of studies indicate that (bird) collision mortality rates per turbine in the UK are low'.

### **Are wind turbines noisy?**

Wind turbines do make noise, but it is worth putting this in context. The indicative maximum noise level of a wind farm at 350m (1150ft) is usually roughly comparable to the sound of leaves rustling in a general breeze (in the region of 35-45 dB). This is a much lower level than is made by road traffic on a country road, for example. A car travelling at 40mph at a distance of 100m (330ft) will create around 55 dB.

Noise impacts are considered within the planning process before any decision is taken whether or not to grant consent to a project.

### **Do wind farms affect house prices?**

It is entirely understandable that homeowners in the vicinity of a planned wind farm will feel concerned that the value of their property might be affected by the presence of a wind farm, although we have yet to see any compelling evidence that this is indeed the case.

### **How do wind turbines affect radar?**

Wind turbines can show up as clutter on radar screens, and this can adversely affect aviation safety. The Ministry of Defence, the Civil Aviation Authority and National Air Traffic Services have a statutory duty to safeguard both sites and airspace from

radar interference. This in turn has led to objections to windfarms on the grounds of national security and air safety.

In 2008 DECC (formerly BERR), Dft, MoD, RenewableUK (formerly the British Wind Energy Association), the CAA and NATS signed a MoU to demonstrate a shared commitment to solve this issue. The Crown Estate and Scottish Executive have also had a significant part to play since then. Together all parties have been looking at possible technical and operational ways to enable wind farms and radar to coexist.