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PARLIAMENTARY BRIEFING

Wind power - myths and facts

April 2012

The aim of this briefing is to provide MSPs with the most up to date facts relating to wind power. A very comprehensive and evidence based account of common concerns regarding wind power can be found in a report by the Centre for Sustainable Energy.[1] **The current vocal promotion of various myths regarding wind power distorts the public discussion about renewable energy and misleads the debate about the role wind power has to play.** Sited appropriately, we believe wind farms have an essential role to play in helping to meet our climate targets by decarbonising our electricity supply. Together with measures to reduce demand and improve energy efficiency, renewable energy – including wind– must form part of our energy future.

Myth: Building a wind farm takes more energy than it ever makes

Fact: A review published in the journal Renewable Energy in 2010[2], which included data from 119 turbines across 50 sites going back 30 years, concluded that the average onshore wind farm produces 20-25 times more energy during its operational life than was used to construct and install its turbines. It found that the average "energy payback" of a turbine was 3-6 months.

Myth: Wind farms are inefficient and only work 30% of the time

Fact: Efficiency is often incorrectly confused with load factor. A modern wind turbine produces electricity 80-85% of the time, generating different outputs depending on the wind speed. The load factor is the ratio of average output over the theoretical maximum output over a period of time (usually a year). For a typical onshore wind farm this is between 28-30%, higher for an offshore wind farm. The load factor of conventional power stations is on average 50%[3]. The *efficiency* of a UK coal plant is typically only 36% to 39%[4], as much of the thermal energy is lost as waste heat. Unlike conventional power stations, no energy is wasted with renewables, and any improvements in turbine efficiency will simply mean an increase in the load factor. Indeed the best performing modern wind farms now deliver load factors of close to 50%[5].

1 http://www.cse.org.uk/downloads/file/common_concerns_about_wind_power.pdf

2 http://www.sciencedirect.com/science/article/pii/S096014810900055X

3 DTI (2004), Digest of United Kingdom Energy Statistics 2004, Table 5.10 http://www.dti.gov.uk/energy/inform/energy_stats/electricity/dukes5_10.xls.

4 http://www.parliament.uk/documents/post/postpn253.pdf

5 http://www.businessgreen.com/bg/james-blog/1810191/the-efficiency-wind-farms-feeble

Myth: Other countries are moving away from supporting wind power

Fact: The global wind market grew by 6% in 2011, increasing by over 40GW on 2010[6]. China remains the largest market, adding 17.6GW of new capacity in 2011 and 18GW in 2010. The Global Wind Energy Council estimates that the global market will be adding about 60GW a year by the end of 2016, by which time cumulative installations will have reached nearly 500GW – compared to about 240GW today. Closer to home, the Danish government has just set a target of 50% of its electricity consumption from a combination of onshore and offshore wind by 2020 and 100% from renewables by 2050.

Myth: Wind energy needs back-up to work, resulting in increased emissions

Fact: All forms of power generation require back up and no energy technology can be relied upon 100%. The UK's transmission system already operates with enough back-up to manage the instantaneous loss of a large power station (for instance when the 1.3 GW Torness nuclear plant shut down in 2011 due to jellyfish[7]). Variations in the output from wind farms are barely noticeable over and above the normal fluctuation in supply and demand over the course of a day. Indeed with improved interconnection and better demand management Scotland could phase out all conventional thermal generation by 2030 and still deliver a reliable and secure electricity supply[8].

Work by the UK Energy Research Council[9], using empirical data and electrical engineering based models has shown conclusively that wind power reduces, rather than increases, emissions from the power sector. The total CO_2 savings estimated from achieving the 2020 100% target would be equivalent to 15 million tonnes of CO_2 per year – a saving of over 30% of Scotland's allowed emissions in the same year.

The dominant focus on wind power in the public debate often ignores the fact that our future electricity system will be supported by a number of different renewable technologies, greater interconnection between countries and improved storage and demand management. All of which combine to improve security and reduce the need for thermal power.

Myth: Wind farms are expensive 'subsidy harvesters'

Fact: The cost of generating electricity from on shore wind has fallen dramatically over the past few years. In the case of onshore wind, a recent report from Bloomberg New Energy Finance made clear that "the best wind farms in the world already produce power as economically as coal, gas and nuclear generators; the average wind farm will be fully competitive by 2016"[10]. In fact, if one takes the price of carbon saved into account, onshore wind farms are already on parity with gas plants. Public subsidy must be proportionate to the maturity and market-readiness of the technology. The Government already recognises that onshore wind is a maturing technology and the number of Renewable Obligation Certificates (ROCS) awarded are already declining as a result.

The growth in renewable generation across Scotland and the UK is happening with just a fraction of the public finance support enjoyed by gas, oil and coal. Recent figures by the

6 See http://www.gwec.net/

7 http://www.bbc.co.uk/news/uk-scotland-edinburgh-east-fife-13971005

8 See http://assets.wwf.org.uk/downloads/power_of_scotland_secured.pdf

9 http://www.ukerc.ac.uk/support/tiki-index.php?page=Intermittency

10 http://bnef.com/PressReleases/view/172

OECD[11] highlighted that gas, oil and coal were subsidised by £3.63bn in 2010 while offshore and onshore wind received just £0.7bn in the year from April 2010.

Opponents of wind farms often point to the constraint payments awarded to wind farm operators. What they fail to acknowledge is that these are a tiny fraction of the payments made to all generators and in themselves simply highlight the importance of improved grid connection, deferred demand and improved electricity storage. In answer to a UK Parliamentary Question the Energy Minister Charles Hendy said that "constraint payments of £176,788 were made to onshore wind farm operators in Scotland in 2010-11, compared to total constraint payments to generators of all types of £170 million over that period. No payments were made to onshore wind farm operators in Scotland in previous years."[12]

Myth: Renewables contribute to fuel poverty

Fact: Portraying gas as a cheap source of electricity and blaming renewables for recent consumer bill rises could not be more misleading. In its latest detailed review of consumer bills in December, the UK Committee on Climate Change made it clear that the 60% rise in consumer electricity bills that we have seen between 2004 and 2010 was primarily caused by an increase in wholesale prices, gas in particular[13]. In fact, of the average £430 consumer electricity bill for 2010, only £16 was attributable to direct support for renewable energy. This assessment is in line with the latest evidence provided by both the Department of Energy and Climate Change and Ofgem, the gas and electricity regulator. Going forward, DECC is predicting a continued increase in gas prices from 44p/therm in 2011 to 68p/therm in 2020.

With heat accounting for more than half of energy demand in Scotland and 60 per cent of household energy costs, reducing demand and moving away from our reliance on fossil fuels towards renewable energy must be the Government's focus for eliminating fuel poverty.

Myth: Most people do not support wind farms

Fact: A 2012 Mori poll showed that two-thirds (67%) of UK respondents were in favour of the use of wind power, with 28% "strongly in favour". One in twelve (8%) are opposed, with only 3% suggesting that they are "strongly opposed".[14] Surveys conducted since the early 1990's across the country near existing wind farms have consistently found that most people are in favour of wind energy, with support increasing among those living closer to the wind farms. Further afield, polls in Australia have shown that 95% of respondents supported the use of wind power, 36% were more likely to visit a coastal area if it had a wind farm, while 55% said it would make no difference. Only 8% of respondents said it would deter them from visiting.[15]

Myth: Wind farms have a negative impact on tourism

Fact: There is no evidence to support the suggestion that wind farms impact negatively on tourism, in fact independent UK studies show the opposite is true[16]. Wind farm developers are often asked to provide visitor centres, viewing platforms and rights of way to their sites. Whitelee wind farm received 25 000 visitors in just nine weeks in 2009[17]. In the 2008 Moffat report to the Scottish Government on the Economic Impacts of Wind Farms on Scottish Tourism

11 See http://www.oecd.org/document/41/0,3746,en_2649_37431_48813609_1_1_1_37431,00.html

12 See http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm111017/text/111017w0007.htm

13 See http://downloads.theccc.org.uk.s3.amazonaws.com/Household%20Energy%20Bills/CCC_Energy%20Note%20Bill_bookmarked_1.pdf

14 http://www.bwea.com/media/news/articles/pr20120419.html

15 http://www.bwea.com/pdf/briefings/tourism.pdf

16 http://www.bwea.com/pdf/briefings/tourism.pdf

17 See http://www.bwea.com/pdf/briefings/tourism.pdf

the report concluded that "the effects are so small that, provided planning and marketing are carried out effectively, there is no reason why the two are incompatible."[18]

As part of the same report, a set of interviews had been conducted with 380 tourists in four case study areas about what they thought about wind farms. 75% of people that were asked had either a positive or neutral view. Only 25% said that they did not like wind farms, while 39% were positive about them, 68% said that a well-sited wind farm does not ruin the landscape, and 48 per cent said that they like to see wind farms.

Myth: Wind power does not create jobs

Fact: Between 2007 and 2010 the wind industry increased its contribution to EU GDP by 33 per cent and created 30 per cent more jobs to employ nearly 240,000 people, despite EU unemployment rising by 9.6 per cent over the same period. The same report by European Wind Energy Association [19] also found the industry's growth was twice that of the EU's GDP overall in 2010 with the sector contributing €32bn to the EU economy. The first comprehensive study of employment across the renewable sector in Scotland[20] concluded that the industry directly supports more that 10,227 FTE posts, including supporting work in the public sector, research and higher education the total is more than 11, 000. Achieving Scotland's renewable target will bring up to £30b investment and in the offshore wind sector alone help create 28, 000 directly related jobs and a further 20, 000 indirect jobs[21].

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18 http://www.scotland.gov.uk/Resource/Doc/214910/0057316.pdf

19 See http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/Green_Growth.pdf

20 See http://www.scottishrenewables.com/static/uploads/hidden_links/sr_jobs_report_21032012_-web.pdf

21 See http://www.scotland.gov.uk/Resource/Doc/917/0118802.pdf