

Nervous energy

Godfrey Boyle, Director of the OU's Energy and Environment Research Unit, discusses how the UK must invest in huge programme of renewable sources to meet our energy needs before a crunch in oil production. Scott Russon reports...

● WITH THE GLOBAL economy in crisis and living costs nearing an all-time high, the news that within the next decade there could be a peak oil crisis is about as welcome as a phone message from Russell Brand. That is, however, the prediction set out in a new report that The Open University's Energy and Environment Research Unit (EERU) has contributed to, mapping out how the UK could mobilise a massive programme of renewable energy and energy-efficiency deployment to head off the crisis.

Godfrey Boyle, Senior Lecturer in the Department of Design & Innovation (DDI) and Director of EERU, discusses the 'Oil Crunch' report and the UK's potential renewable energy future...

Tell us about the report and its purpose...

An increasing number of energy analysts have been suggesting that while the world is not exactly running out of oil, the rate of flow of easily accessible oil could soon be exceeded by demand – possibly as early as 2012-15. It's no so much that there is no oil left; it's getting at it fast enough and making the rate of flow match a demand that has increased hugely during the past few decades – partly as a result of the industrial development of countries such as China.

So experts have been worried about this issue for quite some time – the International Energy

Agency has just released a report underlining these concerns. Dr Jeremy Leggett, who runs the largest UK solar energy company, Solarcentury, recently convened a group called the UK Industry Taskforce on Peak Oil and Energy Security (ITPOES) to discuss the peak oil crisis with various UK companies, including Virgin, Stagecoach, Scottish and Southern Energy, FirstGroup and Yahoo, all of which are to varying degrees concerned about the problem.

How did the OU come to be involved and what is its contribution to the report?

I had worked on a previous report called Zero Carbon Britain that showed how Britain could become a zero-carbon emission country in as little as 20 years or so – which is unashamedly very ambitious. That report came out in 2007. EERU at the OU was approached by Dr Leggett to join the Task Force and we ended up investigating how the UK could cope with a 5 per cent per year decline in oil supplies – for whatever reason, such as political embargoes. There is some anxiety that if oil begins to run short, producing countries might begin to hoard it for themselves. We collaborated with the Energy Savings Trust – it looked at the potential of energy-saving measures and how we could reduce energy demand in the three main energy categories: electricity,



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transport fuels and heat. For example, by reducing heat demand from buildings, installing new technologies such as ground-source and air-source heat pumps, and changing transport fuels, with some vehicles running on biofuels and others on electricity.

Working with the Centre for Alternative Technology (CAT), we looked at energy supply options: how you could supply enough renewable energy, together with installing combined heat and power (which basically involves reclaiming the heat from power generation and using it to heat buildings instead of wasting it). We used an energy modelling system that allows us to see what the effects are if you change your assumptions – for example, if you assume that UK

solar electricity installations start to grow at the same rate as in Germany, where they have an attractive incentive system called a 'feed-in tariff'; or that by 2020 some 2.5 per cent of car passenger-kilometres travelled will be in electric vehicles.

What was the conclusion that you and CAT came to?

We concluded that if our measures were implemented the UK could just about cope with a 5 per cent per annum decline in oil demand from 2011. Our measures should reduce overall energy demand by around 30 per cent from 2008 levels by 2020. This enables carbon emissions to be reduced by a very significant 44 per cent; oil consumption by 46 per cent; coal consumption by 79 per cent; and natural gas by 26 per cent. So we could nearly halve



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UK carbon emissions in 12 years, if we do all the things that we suggest in our proposals.

So what were the main things that you proposed?

On the demand side we suggest things like insulating homes better. On the supply side, it's a very rapid deployment of wind power, tidal wave power, some solar energy, and biofuel heating during the next 20 years. Now while our proposals may seem ambitious, just after we published our conclusions, the Carbon Trust – a Government-funded and very reputable organisation – produced an offshore wind power report that assumes an even higher

offshore wind contribution than we did.

In our report we assumed the existing nuclear power stations continue to contribute to UK electricity supplies. On new nuclear stations there was a range of views in the Task Force but the consensus was that new nuclear is very unlikely to make a significant contribution before 2020, but might do so later.

How much of UK power is produced by the renewable means that you mention?

At the moment just under 5 per cent of the UK's electricity is coming from renewable sources; most of that is wind power plus some biofuels, such

as waste combustion. The Government has now accepted a commitment from the EU to increase the renewables' contribution to UK primary energy – the three types of energy I mentioned earlier: electricity, transport fuels and heat – to 15 per cent by 2020. And because it's more difficult to get the transport fuels and heat levels up to 15 per cent, electricity has to contribute more. The Government's own consultation document talks of renewable electricity providing 35-40 per cent of UK electricity by 2020 – mainly from wind, on- and offshore. We go further by suggesting nearer to 50 per cent. The Government sees 10 per cent of transport fuel coming from renewables, which we agree on, and 14 per cent of heat from renewables by 2020 – we're more bullish, at 27 per

cent. I was at a big wind energy conference recently (wind is now a multi-billion pound industry) and there was quite a lot of optimism that these targets could be met – provided the Government helps to avoid obstacles in the way of deployment

And Britain was recently declared a world leader in offshore wind power generation...

Yes, Britain has overtaken Denmark with the recent commissioning of the latest offshore wind farm. We have something like 200 offshore turbines and around 1,000 onshore turbines. Those numbers would have to go up by about four times as many onshore and perhaps 15 times as many offshore to reach the Government's EU target – but the offshore turbines are now getting very large indeed and with larger machines we may need fewer of them.

So what is stopping the UK from achieving the targets set out in the report?

Political will is the main thing. In order to meet the targets the Government needs to provide the right incentives and it needs to help with problems like grid access – there is a huge queue to get connected to the grid. OFGEM (the Office of Gas and Electricity Markets) could help with that, but it currently only has a narrow remit to consider just the short- and medium-term cost to the consumer; it needs to be given a longer-term remit. This would involve, for instance, putting in connections in advance where we know windfarms will be built.

Action is required by the Government, industry, the regulators and the planners, particularly for onshore wind farms. There's a particularly chaotic local planning system at present – though the Government is bringing in a new planning bill that will deal with major projects to try to speed the process up. It's right that the >

public should be consulted, but the system does need to be streamlined. If we have to have negative decisions then fine, but let's have them quickly rather than waiting years.

Action is required at all levels: the manufacturers have to increase the rate of production; the Government has to make it attractive to invest in renewables (which is starting to happen); the National Grid has to start putting in connections; planners need to speed up the planning process.

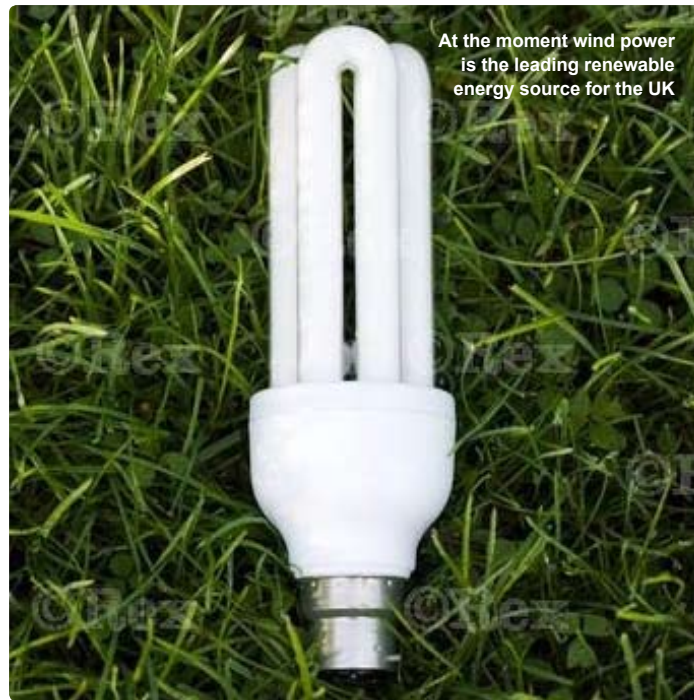
Who actually owns the windfarms in the UK?

In theory anyone can own them but in practice the big windfarms are likely to be owned by the big energy utilities. There are smaller companies that own smaller windfarms but as the scale increases it gets harder to finance them.

An important player in the offshore domain is the Crown Estate, because the Queen effectively owns the seabed around the coast of the UK. Permission has to be sought from the Estate for offshore windfarms. They are now adopting a very cooperative attitude – going into partnership with the big developers for these multi-billion pound projects. It's a complex situation, as they have to worry about shipping routes, fog, sea mammals (including dolphins), seals, birds, ports, gas and oil rigs – there's even talk that when some of the oil and gas installations get dismantled, windfarms will be able to be placed there. It's fiendishly complex. But there are a lot of people working on this – not least because there's a lot of money to be made.

Presumably the energy companies invest heavily in renewable energy technology research and development to preserve their own life span?

Yes, partly it is because fossil fuels are dwindling but also because the Government is giving them obligations and incentives to do so. The Government's Renewables



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Obligation obliges them to produce a certain percentage of their power from renewables – a target that goes up each year. The Government has also just agreed to introduce a 'feed-in tariff', which means if you sell electricity from a wind or solar system in your home to the National Grid, you can get a fixed and quite attractive price. That's the reason for Germany's success with renewable energy. It's good news, as it means that installing renewable electricity systems will start to become quite an attractive prospect for people..

What are the options that are currently available?

There are a lot of options available but at present many of them are not very attractive economically. You can install a biomass boiler, solar water heating, or solar electricity panels on your roof to generate electricity. At the moment in the UK, because there are so few installations the prices are very high – and you don't get much money if you sell your electricity into the Grid. In Germany, prices

are lower for the technology and higher for selling it to the Grid. Largely as a result of this feed-in tariff, the country has 200 times more solar-generated electricity capacity in homes and commercial premises than in the UK.

How much further ahead is Germany with its renewable energy programme compared with that of the UK?

In 2007, Germany produced 14.5 per cent of its overall electricity through renewables, compared with the 5 per cent in the UK. It is much further ahead with its renewables programme than the UK.

Going back to the report, the main conclusion includes some strong statements such as the peak oil is a greater threat than terrorism and climate change...

We're at pains to say that we do accept that climate change issue is extremely important – but peak oil could be a more imminent threat. Some peak oil experts worry that in three to five years' time there will be a

growing deficit of oil, for one reason or another. The main point of this report is to propose action before we get a catastrophic wake-up call where something like rationing might have to come into effect.

So is windpower the future for Britain's energy needs?

There are other renewable technologies such as wave and tidal streams that are at the stage of development that wind was 20 years ago. This technology is still experimental but we know enough to be confident that it will work. We just need to invest time and money in it to make it reliable. But at the moment wind power is the leading renewable energy source for the UK and looks like being the dominant contributor to renewable electricity for the foreseeable future.



The Oil Crunch: Securing the UK's energy future report is available to download at:

www.peakoiltaskforce.net

Course connection Energy for a sustainable future (T206)

If you are interested in energy issues, such as transport, then **Energy for a sustainable future (T206)** may be for you. The 60-point course explores issues such as energy sources, energy consumption, energy conservation, the role of new technologies and how we can move to a sustainable energy future. [Registration closes 17 Dec 2008 for a February 2009 start. Call +44 \(0\)845 300 6090 or visit www.open.ac.uk/courses](http://www.open.ac.uk/courses) for more information. Quote **Sesame** in any correspondence.