Sustainable Blewbury

www.sustainable-blewbury.org.uk

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AGM & Sustainable Blewbury celebration

Wed., 26th March, 7.30 pm
Melland (Community) Room

Shared supper with informal talks on Sustainable Blewbury's work in the past year and discussion on future plans, as well as sustainable initiatives in Oxfordshire and abroad with a special focus on energy and climate change.

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Film evening – 'Thin Ice', with discussion

Wed., 23rd April, 7.30 pm
Melland (Community) Room

Climate science has been under attack, so Simon Lamb (Oxford geologist and BBC documentary producer) took his camera to climate scientists around the world to find out what's really going on.

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Green May Fair: towards a greener future

Sat., 10th May, 11 am – 3 pm
Blewbury School

A joint event with the school and BVS. **Enjoy** a home-made lunch, tea and cakes, and local produce. **Fun activities** for the children – and live music. **Find out how** to reduce your bills and your carbon footprint, eco-renovate your home, encourage bees into your garden and grow your own vegetables.

Editorial: How do we engage with the climate change debate?

Mike Edmunds

It is rather ironic that one of the leading UK voices on climate change and the dangers of rapid global warming is an economist – Lord Nicholas Stern. Following the recent IPCC meeting in Warsaw he wrote: *In September this year 195 governments around the world accepted a summary of the most comprehensive assessment of the basic science of climate change that has ever been written. The IPCC's report, which has been prepared by 259 researchers from 39 countries, shows even more clearly how human activities, primarily burning fossil fuels and deforestation, are creating a dangerous trend with immense risks for the lives and livelihoods of billions of people around the world from shifts in extreme weather, rising sea levels and other serious problems.*

There is now no room for complacency or denial. Yet we have a government who appoint a climate change denier as Environment Secretary and whose department has halved spending on projects linked to global warming and reduced staff related to this work from 38 to 6 by May 2013.

This year we are likely to exceed the global average CO_2 of 400 ppm (check out our website home page). Each year we see the local effects of climate change in melting ice and increase in extreme weather events, not least this winter. Leading politicians are now calling for coal to be left in the ground and for reductions in fossil fuel use. There are real opportunities, not least for new industries and jobs in the renewables market, although controversy remains over the use of nuclear energy. It would be very helpful if the government would lay down a long-term renewable energy policy with targets for the next few decades.

Yes, we are aware of the science but how do we face the hostility and the wall of public silence that surrounds the evidence? What contribution can small communities like Blewbury have in this – helping solve the largest crisis facing the planet. Blewbury *is a community* where we have a better chance than many to *communicate*. Sustainable Blewbury through its various main activities hopes to strengthen community awareness of the issues and (together with other groups in Oxfordshire) take concerted action. We already have a strong Energy Initiative, again this year encouraging energy saving through thermal imaging of people's homes. We also are actively looking at community solar energy and other renewable solutions (not least the upgraded village hall). In other ways (local food initiatives, recycling, travel habits and concern for our natural environment) we encourage sustainable living. Oxfordshire has a strong record in facing up to climate-related challenges and global warming, and has been termed the 'low carbon capital' of the UK. Please follow our website, which has up to date information on energy, climate change and local initiatives.

The urgency of the issues now affecting ourselves, our children and grandchildren needs to be brought down to street level in simple language. The next two years leading up to the Paris 2015 Climate Summit are going to be critical as a last chance to take action to keep global warming below danger levels. We invite you to be involved in the discussion about how we in Blewbury and further afield can have a voice in this debate; it has now become a social and moral issue and has moved beyond a scientific or an economic one.

Yet Lord Stern should have the last word pointing out the opportunities of action now – little less than a new industrial revolution in fact: *What we could do instead is create a story of rising living standards, stronger communities and a more resilient society, embracing the challenge of poverty reduction – with everlasting benefits. Our children and grandchildren could inherit a low-carbon economy that will be safer, as well as cleaner, more secure and more efficient, created through investment in an exciting period of technological innovation.*

* * *

Whatever happened to peak oil?

Eric Eisenhandler

Introduction

A few years ago, many experts were stressing that 'peak oil' is just as serious a concern as climate change, and that drastically reducing our use of fossil fuels – coal, oil and gas – is essential for minimising the effects of both these problems. Our current way of life is absolutely dependent on fossil fuels, and so would have to change.

We hear less about peak oil now, but it has not gone away. Things have just become more complex – because in addition to the declining sources of cheap, easily accessible oil there are new, unconventional sources. But they are in difficult, dangerous places like the Arctic or deep oceans, where accidental spills could cause huge environmental damage, or in the form of tar sands (photo) which require costly, energy-consuming extraction that produces massive pollution.

These new sources of oil only work economically if the price of oil is high enough to justify their high cost and high risk. Partly because of this, some of the emphasis has shifted to using natural gas.

Athabasca tar sands, Canada

Peak oil

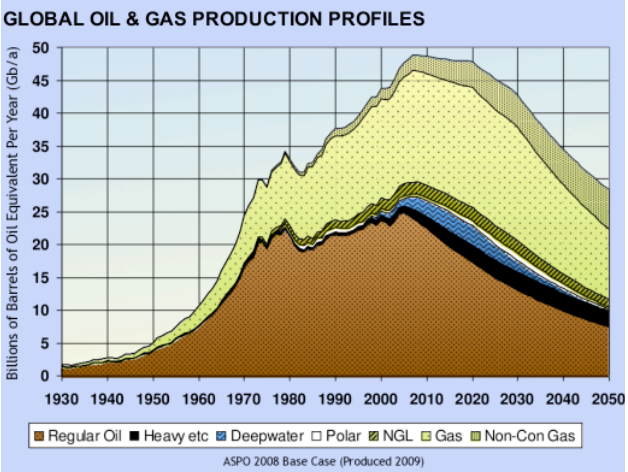
In the early 20th century, plentiful oil allowed what was a coal-based industrialised society to massively accelerate its development. Every year since then more oil has been used, except for the two 1970s oil shocks when Middle East crises caused worldwide recessions.

Why oil? Of all the fossil fuels, oil is uniquely energy dense and, being a liquid, is easy to transport and store. And it was cheap, with new oil fields to exploit as the older ones ran out.

The depletion pattern of oil fields means that the flow of cheap, easy oil to the market, which has been steadily increasing for over a century, would peak. The problems start around the time when around half of the easily and cheaply recoverable oil has been extracted. Oil production becomes ever more likely to stop growing and begin a terminal decline, hence 'peak'. The peak in oil production does not mean 'running out of oil', but it does mean the end of cheap oil, switching from a buyers' to a

sellers' market. At that point, oil gets more expensive (in cash and energy terms) to extract. In addition, prices also rise if there are political problems due to dependence on oil from other countries.

New sources of oil either difficult to extract (e.g. tar sands) or in difficult locations (e.g. the Arctic) start to be economically viable as the price rises. But the newer sources of oil *don't solve the problem*, they just delay it because they too will run out. They also have huge problems of cost, environmental damage and extra energy needed to extract them



Some experts say that conventional oil peaked around 2006–2008; a projection is shown above. Despite new discoveries and increasing reliance on unconventional oil sources, global oil production is declining at about 4% per year. New discoveries have not matched consumption since about 1986. While the industry claims that there will be adequate flows of just-about-affordable oil for decades to come, oil fields are depleting at more than 6% per year, according to the International Energy Agency.

Whether or not peak oil has already passed or is soon to happen, the disagreement is merely about whether the crunch will be sooner or later. The final peak will be decided by how much we can afford to pay. If we can afford to pay more we could produce more for a few more years, but it would still break economies in the end. As Dr. Richard G. Miller put it: *We're like a cage of lab rats that have eaten all the cornflakes and discovered that you can eat the cardboard packets too. Yes, we can, but...*

Gas

Natural gas has been widely promoted to bridge the gap until we have developed sufficient clean electricity. Gas emits less CO_2 than oil or coal when used to produce energy. But it still emits far too much CO_2 to be a long-term solution.

And like oil, easily accessed gas has also been running low. Recently, gas from shale has been hugely hyped to get around the problems of peak and 'difficult' oil. This has been led from the US, where large quantities of shale gas and shale oil, deep underground, are now being extracted by hydraulic fracturing, or 'fracking'. A significant point is that the shale gas is not dependent on foreign suppliers. However, there are very serious questions about how much damage fracking causes, and how much gas can really be extracted (see next article).

One side effect of cheap shale gas in the US has been increased exports of cheap, unwanted coal. This has had an adverse effect elsewhere: for example coal's share of UK electricity production has increased in the past couple of years.

Further comments

We have rapidly varying electricity demand and intermittent renewables such as wind and solar. Until we invent something better, we do need a way to provide electricity generation that does not cost too much, can be turned on and off at short notice, and which emits less CO_2 than coal or oil. Most scenarios that show how to decarbonise energy supplies in the next few decades recognise that gas could fill that need. But it is hard to persuade energy companies to build gas-fired generators that are not meant to be used full-time.

One hope has been that we could continue to burn fossil fuels safely by capturing the emitted CO_2 and storing it underground. So far, progress on carbon capture and storage has gone nowhere due to difficult technology, high costs and finding suitable places to store enough CO_2.

Finally, we simply cannot go on burning all available resources of fossil fuel. There are various estimates of how much fossil fuel could be used, depending on how much climate change is 'tolerable' and varying estimates of the effect of CO_2, but a rough summary is that to achieve the goal of limiting global warming to 2°C, 60–80% of proven reserves of fossil fuels will have to remain in the ground. But as yet there are no signs that this crucial message has had any effect!

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Why we do *not* need shale gas

Mike Edmunds

Good news!? Blewbury is not under threat from shale gas exploration. The nearest suitable geology lies in north Oxfordshire. But it is of some concern why a small, densely populated island like Britain is leading a stampede for shale gas when other countries (France, and also US states such as New York and New Jersey) have banned hydraulic fracturing for gas exploitation, and many others are considering banning it.

Hydraulic fracturing (fracking) is a well-established technology used widely for enhanced recovery in the oil industry. (I have been involved in using it for geothermal exploration.) Improvements, especially directional drilling and use of a cocktail of chemicals, have now made the recovery of 'tight gas' from shale possible.

Shale is a common rock, formed from mud that is rich in organic matter. Millions of years of heat and pressure have turned the organic material into gas or oil. Fracking works by pumping water, sand and chemicals into the shale at very high pressure. This breaks open cracks in the rock, so the gas can escape into a well. Very large amounts of water are needed, which can deplete local water supplies.

Geologists have identified potential resource areas in Britain but that is just the start, since proving any resources will take at least five years, probably ten according to Vince Cable. Moreover, evidence from the US indicates steep declines in productivity of most shale gas wells – typically their output falls by 50% to 60% or more in the first year of production. In the US it may be easy to keep moving on from place to place, but not in Britain. Despoiling the countryside and disrupting the mosaic of quiet villages and towns here must be a major reason to restrict or reject shale gas exploration and development; the constant to and fro of heavy tankers and drilling vehicles would be detrimental to our rural infrastructure.

Burning natural gas as a fuel emits CO_2 at half the rate of coal, but that is comparing it to the dirtiest fuel we know. In the long term we must hugely reduce the amount of gas that we burn.

In Britain we have a strong regulatory structure, so hopefully contamination of water supplies through drilling would be a low risk, although disposal of chemical wastes presents real problems. Risks of earthquakes are also overstressed.

However, there is an *understated* risk in the long-term leakage of methane, a greenhouse gas 20 times more potent than CO_2, from the disturbed rock strata. Significant methane leaks could mean that using shale gas might be as harmful as coal.

So communities and local authorities up and down the country are being offered 'bribes' to take on a fracking experiment for largely irreversible damage to their environment. As Rob Hopkins of the Transition Movement has said: *There is an ethical issue here. Why is it OK for large energy companies to buy the rights from the government to a resource that really belongs to the people of this country, in order that they extract it, sell it back to us, take the bulk of the profits elsewhere, leave us with the mess, and having to live in the warmed and more unstable climate thus created?* More jobs may be created but probably less than the longer term, local jobs created through a renewables industry.

Shale gas well in Pennsylvania, USA

But the market may have the last word. Many analysts agree that the observed decline in rates of shale oil and gas production could result in a lightning-quick shale boom. Shares in Cuadrilla, the leading UK shale gas company, are now worth only 25% of 2009 values. Unlike renewables, the economics of fracking operate in the kind of surreal and illogical world of high finance.

Fracking centralises power into fewer and fewer powerful hands when we need to be doing exactly the opposite. Ironically, by 2025 when the gas might be available our international commitments on climate change would in any case not permit it to be combusted in any significant quantities.

So in conclusion, we should not take the risks with shale gas and instead concentrate as far as possible on renewable sources which lend themselves to community ownership, to decentralised ownership models and community investment.

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I used to think that the top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don't know how to do that. *Gus Speth, US adviser on climate change*

Nuclear Power: pros, cons & UK status

Eric Eisenhandler

This article briefly summarises the advantages and possible problems of nuclear power, and then describes the current situation regarding new nuclear power stations in the UK. Nuclear power is controversial – are you in favour or against? Make up your own mind!

Nuclear power currently provides 15–18% of the UK's electricity. However, we have only one modern reactor and all the rest are due to be turned off within the next decade, though their lifetimes may be extended due to delays in building replacements.

Elsewhere, although many new reactors are being built in China and other Asian countries, this has been counter-balanced by countries that have cancelled plans for new reactors post-Fukushima, such as Germany, Switzerland and Japan. Cheap shale gas and rising reactor costs have also led to cancellations in the US. The UK is now almost alone in Europe in encouraging new nuclear power reactors.

Pros and cons

Low carbon – Nuclear reactors don't emit CO_2 in operation. However, uranium preparation (mining, purification and enrichment), reactor construction, radioactive waste disposal and decommissioning old reactors all do emit CO_2. The full life-cycle is therefore low carbon, not no carbon. And in its present form, nuclear generation is not renewable.

Always-available generation – Unlike our present renewable sources, most notably wind and solar, nuclear reactors work all the time and so can provide baseline electricity. The main caveat is that when they have problems they can be difficult to repair and may not be available for long periods.

Energy security – Although we have to import uranium, the rest of the life-cycle is UK-based. However, if nuclear power is widely adopted usable deposits of uranium will start to run out.

New reactor designs – There are many proposals for new reactor designs that might be safer, and which use uranium much more efficiently and/or breed their own fuel. However, they tend to use very difficult technologies and would need decades of development before they might be viable.

Costs and timescales – The industry's track record has not been good. Nuclear power costs are dominated by construction and decommissioning – actually running reactors is relatively inexpensive. Although nuclear is a relatively mature technology, construction costs have increased hugely for the new generation of reactors and construction timescales have not been met. Additional safety provisions added after the Fukushima disaster have contributed to rising costs and delays.

Safety – On the whole, nuclear power reactors have operated safely and suffered just two very serious accidents. Recent designs are claimed to be even safer. However, although there are disagreements about the eventual number of casualties, both Chernobyl and Fukushima were catastrophic: they displaced hundreds of thousands of people, the ruins remain in extremely dangerous states, and the costs of cleaning them up are enormous and not yet fully known. If many more reactors are built, and especially if they are in countries with weak regulation and monitoring, accidents might become more frequent.

Nuclear waste and decommissioning – Despite decades of discussion, only Finland and Sweden are currently building underground waste disposal facilities for dangerous radioactive waste – elsewhere plans are stalled. Decommissioning old reactors and other nuclear facilities is a very long-term procedure, and the costs are huge.

Nuclear weapons – Having more nuclear reactors in unstable regions of the world might lead to more countries acquiring nuclear weapons, and the associated danger that they will be used.

Terrorism – Nuclear fuel or radioactive waste might be used in various ways by terrorists.

Current UK status

The Coalition government wants to replace our present reactors and if possible expand the nuclear share of electricity generation. However, it initially pledged that new nuclear would not be subsidised as it was a relatively mature technology. The initial aim was to get new reactors operational by about 2018.

After long delays, in October 2013 a deal was finally announced for EDF to build two reactors at Hinkley Point and possibly two more at Sizewell.

These are a new design from Areva, called EPR, which is claimed to be somewhat safer and more efficient than existing reactors.

Two EPRs are currently under construction by EDF in Europe, in Finland and France, and things have gone very badly. Their cost has roughly tripled and the timescales have more than doubled – neither is operating yet.

EDF's proposed Hinkley Point C

For the UK, the estimated cost has risen to about £8bn per reactor – the most expensive reactors ever. Even optimistically, the first would not be working until at least 2023. EDF's original partner, Centrica (owner of British Gas), has pulled out and been replaced by China General Nuclear Power Group (CGN), so this 'private' project is comprised of three foreign government-owned firms: EDF and Areva, both French, and CGN, Chinese.

The government denies that the deal with EDF includes a subsidy, but few others agree. The government is guaranteeing any loans EDF takes out up to £10bn, and EDF's liability in case of problems or accidents has been limited to about £1bn. What caught the headlines was that the electricity generated would get a guaranteed price of 9.25p per kilowatt-hour (8.95p if EDF also builds reactors at Sizewell). This is about double the current wholesale price, it's guaranteed for 35 years from when the reactors start to produce electricity, and it's indexed for inflation. If the wholesale price of electricity is below the guaranteed level the taxpayer will pay EDF the difference, but if it is above the guaranteed price (i.e. if it has more than doubled in real terms) EDF will pay back the difference. Over 35 years the possible cost to the taxpayer adds up to many billions of pounds.

This agreement needs EU approval, because it may represent an illegal subsidy or violate competition rules as there was only a single supplier involved. EDF will only start serious construction after it is approved, which adds further delay. And there is a real possibility that it will not be approved.

There are two other proposals for new reactors in the UK that look as if they might materialise. The Horizon consortium, originally made up of German companies E.ON and RWE, has been sold to Hitachi. The proposal is to build two reactors each at Wylfa and Oldbury. These would be Advanced Boiling Water Reactors (ABWRs), a less advanced design than the EPR that does not yet have UK safety approval, a process that takes several years at best. A few ABWRs have operated in Japan – their reliability has been surprisingly poor.

Finally, the NuGen consortium proposes to build reactors at Moorside, a new site near Sellafield. NuGen was started by Iberdrola (Spanish owner of Scottish Power), Scottish and Southern Energy, and the French GDF Suez. SSE left, then Iberdrola sold its share to Toshiba, which now proposes also to buy most of GDF Suez's share. Toshiba says it plans to build up to three of its Westinghouse AP1000 reactors, like the EPR a modern design which RWE and E.ON had taken through much of the UK approval procedure before selling Horizon. Quite a few AP1000s are currently being built in the US and China, though none are operating yet.

There is a much more detailed discussion of these issues on the Blewbury Energy Initiative's website: www.blewbury.co.uk/energy/fission.htm

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Community energy – an option for Blewbury?

Ian Bacon

Dealing with issues such as climate change and security of energy supplies will need effort and commitment from all levels of society, from individual to international governmental action. Community energy projects sit between those two extremes, are already taking place all around the world, and in the right circumstances can have an important role to play.

Community-scale energy projects enable proactive citizens to make the biggest possible difference – much more than they could just by focusing on their own lifestyle or writing to their MP. In addition, community-scale projects such as wind and solar energy can be installed rapidly compared to nuclear and fossil-fuel power, and are substantial enough to be noticed and duplicated elsewhere in Britain and the wider world.

One of the earliest examples of a community energy group and where such an approach can lead comes from South Wales. Awel Aman Tawe (AAT) is a small charity and social enterprise working with other community groups, community councils and

partner organisations. The project focuses on the establishment of a 4 MW community wind farm. The wind farm will act as a local asset – the anticipated operating profits from electricity sales will support a range of sustainable initiatives linked to clean transport, local food, energy efficiency and micro-renewables, education and training. The proposed wind farm is located 20 miles north of Swansea in the Amman valley. The participating community comprises the 12 villages in the Upper Amman and Swansea Valley surrounding the wind farm site on Mynydd y Gwrhyd.

From small beginnings, this group has been able to have a positive influence on the issues of climate change, energy efficiency, fuel poverty, social cohesion and employment, and has done so with the full backing of its local community.

There are many, many other examples, both on a larger and smaller scale, in the UK and abroad, that we could highlight. Community-owned electricity generation is becoming an important part of the energy mix in Germany, and I have visited biomass-powered district heating networks run by local farmers in the province of Styria in Austria.

Osney Lock hydropower, Oxford

Local examples include hydropower schemes being developed on the River Thames at Osney Lock, Abingdon and Goring, and the Westmill wind and solar farms on the Oxfordshire/Wiltshire border. But the pertinent question is what type of community-scale energy initiative is appropriate to Blewbury?

Westmill wind and solar co-ops, Watchfield

As a starting point, the Blewbury Energy Initiative (as part of Sustainable Blewbury) is working with the Oxford-based Low Carbon Hub (LCH) (www.lowcarbonhub.org) on a community energy scheme within the village, whereby a share offering will be made available to villagers and the wider community to invest in a solar photovoltaic installation on Blewbury School. More details of this will be made available when ready. This is part of a wider project operated by the LCH, in which they aim to install large solar-panel arrays on a number of Oxfordshire schools this summer.

Could this scheme be expanded or replicated for other buildings within in the village? Could other renewable technologies be considered as viable for a Blewbury-based community energy scheme? Are there opportunities within the sphere of energy efficiency? Sustainable Blewbury and the Blewbury Energy Initiative will continue to consider these issues and welcome any feedback, assistance or help anyone would care to offer.

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New leaf bays at Blewbury allotments

Angela Hoy

Leaves cleared during the annual village clean up in November have been transferred to the allotments for eventual use as leaf mould. Leaves cleared and stored from last year were also available. We had been offered the remains of a garden shed that had been demolished by a falling tree in the recent gales. This was taken to the allotments and then knocked together to form the bays. Although very rough and ready, they will do the job for a couple of years at least. It is very appropriate that we have been able to create a new amenity for the local population, making use of the autumn leaves as well as recycling the trashed shed!

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We welcome new members. If you are interested in getting involved please contact our chairman, Mike Edmunds: wme@btopenworld.com