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Editorial

Jo Lakeland and Eric Eisenhandler

Welcome to our second newsletter of 2015. Our aim was to have three newsletters per year, but two things have blown us off-course. The first was of course the unexpected and devastating loss of our chair, Mike Edmunds, who was a major inspiration and driving force in Sustainable Blewbury.

No one in the SB Core Group felt able to fill Mike's shoes on their own, so we have decided to try sharing the role. We (Jo and Eric) are currently acting co-chairs, and at our next AGM we will review how that is working.

On Open Gardens day back in June, we had a poster exhibition illustrating Mike's work in the BVS

Environment Group and then Sustainable Blewbury; you can download the posters from:

www.sustainable-blewbury.org.uk/Mike.pdf

The second thing to hit us was increasing work on the forthcoming Blewbury Neighbourhood Plan. No less than five members of the Core Group are now involved with the plan various ways, and as we approach a first version of the Plan for the six-week consultation with the village the preparations are very time-consuming – but hopefully are peaking.

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What comes next? The aftermath of the Paris Climate Change Conference

Jo Lakeland

After more than 20 years of failure to agree a new global climate deal the rich and the poor countries agreed to differ on some details, and on 13th December 2015 the 196 countries reached an agreement on climate change.

The agreement that was adopted at this historic conference is far from perfect. But as UN Secretary-General Ban Ki-moon said, it marks the first time that 'every country in the world has pledged to curb emissions, strengthen resilience and join in common cause to take common climate action'.

They agreed to:

- Attempt to keep the average temperature rise since the industrial revolution to well below 2 °C, and to aspire to 1.5 °C.
- Review their own progress every five years so they can ratchet up their commitment.
- A long-term aim that greenhouse gas emissions would reach a peak as soon as possible and then would be rapidly cut, eventually to reach a point in the second half of this century when total emissions are no more than nature can soak up.
- Give money to help developing countries to adapt to clean technology, although not as much as was hoped.

All countries have had to make compromises to reach this deal, and it has to be remembered that the pledges made at the start of the conference were not

enough to limit the average global temperature rise to 2 °C: they limited it to about 2.7 °C. It will need a fundamental change away from fossil fuels, led not only by the politicians but by technical innovations.

It all sounds very promising, and it is the first time the politicians have reached an agreement, but the real work begins now.

In an interview with Amber Rudd, the Secretary of State for Energy and Climate Change, on the Andrew Marr programme on 13th December, she was asked how much of what was agreed in Paris is legally binding. Her reply was that the five-year assessments, monitoring and reporting on progress, are legally binding, but that everything else is aspirational. It is impossible to enforce the measures needed if a country is falling behind on what it needs to do to keep on target, and the temperature goals are purely aspirational.

She was then asked which policies since 2015 could she hold up and say these *will* cut carbon emissions. She replied by saying that the UK was the first nation to put an end date for coal: 'there can be no role for conventional coal generation in the UK beyond the early 2020s'. The government wanted to expand offshore wind and to provide better value for money for energy: 'driving down prices is critical'. On being questioned on the removal of most of the subsidies on renewables, she said that there is no point in renewables that are expensive; it is all about value for money! (See *A wrecking ball hits renewable energy in the UK*, also in this issue.)

The interviewer persisted: 'it's a funny time to cut subsidies on renewables' and asked about imposing the climate change levy (a carbon tax!) on solar electricity. Her reply was that it was because nearly one-third of the subsidy was going abroad, and it was not right to do that with taxpayers' money. (Note that four of the 'big six' energy companies are French, German or Spanish owned, so that is also taxpayers' money going abroad.)

So although the outcome of the 21st UN Climate Change Conference is encouraging, we do need to make it clear to MPs, Ms. Rudd and other members of the government what we think of the outcome of the conference, its lack of binding legal agreements, and what we expect of them. We can do our bit by being aware of the final agreements and reminding the politicians of what was promised. We will be adding a note of what you might want to include in a letter, a template letter you can adapt, and addresses of who you might write to on the home page of the Sustainable Blewbury website: www.sustainable-blewbury.org.uk Please do make use of them.

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Climate change briefs

Eric Eisenhandler

The 'pause' is over

Global warming doesn't mean the average temperature rises every year – there are other, short-term factors so it's the longer-term trend that's crucial. Depending on exactly how the data is analysed, 2014 was either the warmest year on record or tied with 2010 and 2005. As for 2015, although we don't have the final word yet it's already very clear that this year will be by far the hottest on record. The temporary slowdown in the warming of global surface temperatures (misnamed the 'pause') has ended, as each of the past four years has been hotter than the one before.

The agreed target is to limit the global average temperature rise to 2°C – we are now halfway there.



Fossil fuel companies risk wasting up to \$2tn

A deal to limit global warming to 2°C would mean that the world must use much less fossil fuel. A report from think tank Carbon Tracker estimates that \$2.2 trillion of projects aimed at producing fossil fuels could be left 'stranded', i.e. worthless. No new coal mines would be needed, and oil demand would start to drop after about 2020.

The countries with the most to lose are the US, Canada, China and Australia. The UK's North Sea oil and gas projects are also at risk.

The current low price of oil has given a taste of that already, with expensive, risky and/or dirty sources of oil such as the Canadian tar sands and the Arctic becoming uneconomic.

Anthony Hobley, Carbon Tracker's chief executive, said: 'Business history is littered with examples of incumbents – like Kodak and Blockbuster – who failed to see a transition coming,' said.

Uruguay: running on renewable energy

In the past 15 years, Uruguay has undergone a remarkable transition. Renewables now produce 94.5% of the country's electricity, at lower cost (in

real terms) and more reliably than in the past due to a more diverse and resilient mix of sources.

Uruguay already had a lot of hydropower, and no more has been built. Nor is there any coal or nuclear power. What they have added – without any government subsidies or higher costs to consumers – is wind turbines, solar and biomass. This has been possible due to strong cross-party decision-making, supportive regulation and a strong partnership between the public and private sectors.

Uruguay used to import much of its electricity from Argentina; now they export a third of their electricity to them.

The transport sector still depends on oil (total energy consumption in Uruguay is currently 55% renewables, compared to a world average of 12%), but the country has set a very ambitious target of an 88% reduction in its carbon emissions by 2017 compared to its average for 2009–13.



Poo-powered bio-buses

Buses powered by bio-gas, generated from sewage and food waste, are planned for Bristol. Wessex Bus has proposed to operate 20 buses and First West of England has plans for 110 double-deckers, fuelled by a subsidiary of Wessex Water. Both companies have applied for grants from the Office for Low Emission Vehicles. The UK's first bio-bus using gas from sewage went into service last year, on the number 2 route (appropriately).



The proposed refuelling station would be built at the sewage treatment works in Avonmouth. The plans

are for the buses to run in areas with the poorest air quality. Since the gas comes from renewable sources, the buses would have a carbon footprint 89% less than a diesel bus.

* * *

'By far the biggest obligation, or future burden, on consumers and households is the Hinkley Point C nuclear project. I am very pro-nuclear and pro its low-carbon contribution but this must be one of the worst deals ever for British households and British industry. Furthermore, the component suppliers to EDF are in trouble, costs keep rising, no reactor of this kind has ever been completed successfully, those that are being built are years behind and workers at the site have been laid off, so personally I would shed no tears at all if the elephantine Hinkley Point C project were abandoned.'

Lord Howell of Guildford, former Conservative Secretary of State for Energy, 1979-81 (and George Osborne's father-in-law), July 2015

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A wrecking ball hits renewable energy

Eric Eisenhandler

Amber Rudd, Secretary of State for Energy and Climate Change, made her first major speech on energy policy on 18 November. She said that the UK's coal-fired power stations would all be closed by 2025. The UK is the first major economy to set such a deadline and that should be applauded, even though most of these plants would have had to be closed anyway due to EU sulphur pollution rules.

That was the end of the good news! Ms. Rudd then tried to justify a rapidly growing list of changes that amount to dismantling the government's support for renewable energy and energy efficiency.

Just before the speech, a leaked letter from Amber Rudd to other ministers revealed that as a result of the changes, the UK will not meet its agreed target for reducing carbon emissions. This called for 15% of total energy consumption (not just electricity) to be from renewable sources by 2020; the forecast is now for 11.5%. Instead of building 34 gigawatts (GW) of new renewable capacity by 2025, the new target is 22 GW.

The justification for this is claimed to be to help 'hard-working families' by saving the extra costs on their energy bills used to subsidise renewables. But no figures for that were mentioned, and in fact the savings will only be a few pounds per year for most households. No mention was made of the huge subsidies being paid to the oil, gas, and (probably soon) nuclear power industries. What is being pushed instead of renewables is fracking, and a lot

of new gas-fired generators that would still be in use long after they should be shut down.

The speech also cut energy efficiency measures that could save individuals and businesses money, reduce carbon emissions, and support jobs.

Here is a summary of the main cuts.

Onshore wind: The current subsidy arrangement (Renewables Obligation, or RO) will be closed to onshore wind in April 2016, a year earlier than expected. New projects are unlikely to be eligible under the new Contract for Difference system. Onshore wind is by far the cheapest renewable technology and generates over 5% of UK electricity. This is the only cut listed here that was in the Conservative Party's election manifesto.

Solar farms: In April 2015 solar farms above 5 MW became ineligible for RO support. Then, in July, the government said that RO support for solar farms below 5 MW would end in April 2016, a year earlier than planned.

Feed-in tariff (FiT) cut: The government has just announced results of a consultation on their proposed 87% cut in the feed-in tariff for small solar systems, along with substantial cuts for small wind turbines, anaerobic digesters and small hydro. The response was strong, and the proposed cut has been moderated to 'only' 63%. For solar, this is the latest of several big FiT cuts brought in at short notice, making it impossible for installers to plan their futures – quite a few have already gone out of business, and thousands of jobs are being lost. The government claims solar has already reached the number of systems expected for 2020. Why not celebrate instead of turning support off? It says cutting feed-in tariffs will reduce electricity bills, but that's only by a couple of pounds per year.

Pre-accreditation scrapped: This allows large installations to pre-register so they know what level of FiT to expect. The government has decided that the biggest installations (more than 50 kW) can still do this, but community and business renewable projects (e.g. mid-sized rooftop solar arrays) can no longer be pre-registered. This means they can be caught out by abrupt reductions in the FiT, and is a big deterrent from investing in renewables.

Community energy tax-relief scrapped: Tax relief for investors in new community renewable-energy schemes such as solar schools, onshore wind and micro-hydro has just ended. This has led to numerous community schemes being scrapped.

Climate Change Levy on renewables: The levy is a tax aimed to reflect the carbon content of fossil fuels. It has now – perversely – been extended to include renewables. The result is said to be an

additional cost to green energy producers of around £450M this year, and up to £1bn by 2020.



Orchard Fields Community School, Banbury

Carbon Capture and Storage (CCS): The £1 billion UK budget for developing CCS has been withdrawn and major trials for CCS, the main hope for retaining some fossil-fuel use, has been dropped.

Vehicle Excise Duty (Road Tax): At present this rewards low-carbon-emitting cars in their first year, and by somewhat less every year thereafter. But for new cars bought from April 2017 only the first year's tax will depend on emissions; afterwards all cars will pay the same £140 annual fee. (New cars costing over £40,000 will pay a £310 supplement for five years.)

Zero-carbon houses: The target to make all new houses zero carbon by 2016 has been scrapped. That will increase bills for occupants, as well as emitting more carbon. If the problem is rising consumer bills, as the government claims, then the right solution is to invest in home insulation. Just one example of the government ignoring energy efficiency.



Energy Company Obligation (ECO): This is a scheme requiring large energy providers to provide energy efficiency measures for low income and vulnerable households, costing £800M per year; it's due to end in March 2017. A replacement scheme, starting in April 2017, is proposed to cost £640M per year. The reduction will affect many cold, older houses that are too expensive to heat adequately, costing people – and the NHS – more money.

Green Deal: In its first year the Green Deal caused a 60% drop in home energy efficiency measures installed, and when it was abruptly cancelled no one mourned. But there is no replacement proposed. Again, cold old houses mean huge heating bills, too expensive to heat for many.

Renewable Heat Incentive (RHI): The government claims to be increasing funding for the RHI while reforming the scheme to deliver better value for money. But analysts calculate that this will actually amount to a cut of 40%. Details of the proposed changes are not yet available.

The real issue?: I think much of the motivation for these changes is a decision to try to preserve electricity generation from big, centralised power plants (conventional and fracked gas, offshore wind and nuclear) rather than a switch to distributed, small-scale renewables (onshore wind, solar; biomass/biogas and small hydro), many owned by community groups and individuals.

And finally: As I was finishing this article, HMRC announced that in August 2016 VAT on domestic solar panels, wind and hydro turbines would be quadrupled, from 5% to 20%, while coal, oil and gas would remain at 5%.

* * *

'This is grotesque hypocrisy from a government that has spent the past few weeks dismantling an architecture of low-carbon policies carefully put together with cross-party agreement over the course of two parliaments. They have swept it all away without signalling their intent in their manifesto. They have no mandate for this – it's David Cameron sticking up two fingers to other nations at the climate conference in Paris. Unbelievable.'

Craig Bennett, Friends of the Earth CEO, July 2015

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The origins and early days of Sustainable Blewbury

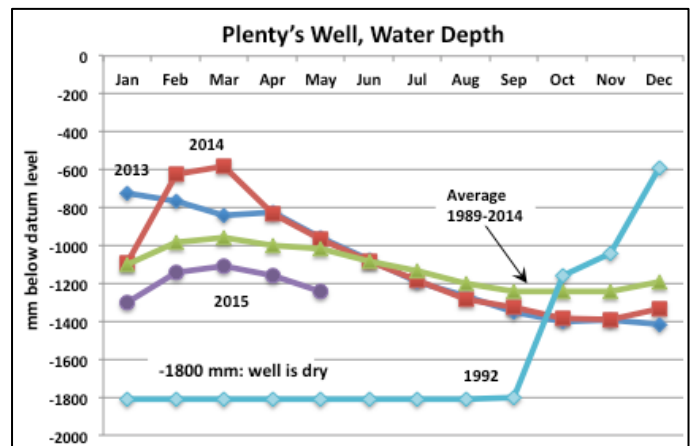
Jo Lakeland

The Blewbury Village Society (BVS) was founded in 1966 with the aims of organising social activities within the village and protecting the village environment, but in 1992 a group of people became concerned about various threats to the environment of the village.

Some of these concerns were similar to those of today: Didcot B power station was being developed and it was thought that there might be speculative development between Didcot and East Hagbourne. Church Moor was also under threat of development and there was concern that the character of the

village would be damaged by loss of green spaces and the characteristic architecture of the village.

One concern was very different to 2015: the Cleve (and many of the village streams) had been completely dry since December 1991, as shown in the records of the water depth of Plenty's Well:



It was decided that a BVS action group should be formed 'to restore streams and springs', and this was done in February 1992 (as reported in that month's Bulletin). The group was led by Bernardine Shirley-Smith and Mike Edmunds, who was an internationally respected expert in ground-water resources, working at that time for the British Geological Survey. (to be continued in the following article on Blewbury's water)

Returning to the origins of Sustainable Blewbury: forming the Action Group led directly to the formation of the Blewbury Village Society Environment Group (BVS-EG) in July 1993. The aims of the BVS-EG are summarised in the box below, taken from the September 1993 Bulletin:

BVS Environment Group

The Blewbury Village Society has formed an Environment Group and has appointed a committee to monitor:-

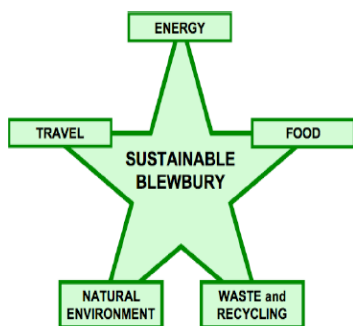
- * The fabric of The Village
- * Open spaces & footpaths
- * Springs, streams & the natural habitat
- * Local Area issues likely to have an impact upon Blewbury

Early members of the BVS-EG in addition to Mike and Bernardine were Mike Marshall, John Mather, Simon Rendel and Anita Rendel. Anita became the first chair of the group, followed by Bernardine; Mike Edmunds eventually became its chairman when he retired from full-time work in 2002.

The BVS-EG's monitoring of the village fabric took several forms, including an 'anti-beauty contest' poll in 1992 to find the most disliked piece of street furniture in the village. The barrier at the Westbrook Street end of the Watery Lane footpath was the clear winner. The reason it is still there in spite of its incongruity is because the gaps between the vertical railings are narrow enough to prevent children running out into the traffic on Westbrook Street.



The BVS-EG continued to evolve under Mike's leadership: the Blewbury Energy Initiative (BEI) was formed in 2005 as a direct result of the 2004 Parish Plan. Its first convener was Hugh Osborn, its stated aims being to reduce the carbon footprint of the village by improving energy efficiency, to introduce renewable energy technology and to reduce fuel poverty.



21st Century Sustainable Blewbury

Mike Edmunds' first interest was always in the environment of Blewbury, but he gradually became aware of the importance of sustainability in keeping climate change to a minimum. In 2009 he proposed that the BVS-EG should become Sustainable Blewbury (SB), with the five interest areas shown in the diagram above. Each interest area was to be led by a member of the SB Core Group, which met roughly monthly to report on and discuss their activities. Details of the structure of SB and the projects developed by the interest groups are the subject of the first Newsletter sent out in March 2010. (All the Newsletters are available online, linked to the left hand side of the [SB home page](#))

SB also joined the Oxfordshire Community Action Groups (CAG) network in 2009, benefiting from their support and the contacts made with other local CAGs. In 2012 we became independent of the BVS.

Sadly, Mike was diagnosed with an aggressive late-stage lymphoma in April this year, and passed away two weeks later. He had a wide-ranging knowledge of the environment and always knew the right person to contact in any situation, so he is sorely missed. None of the Core Group felt sufficiently qualified to take over as chair, so the members of the Core Group decided as an interim measure to

appoint two people as co-chairs of the group. Eric Eisenhandler and Jo Lakeland are now acting co-chairs of Sustainable Blewbury.

Thanks to Hugh Osborne, Anita Rendel and Bernardine Shirley-Smith for the information on which this article is based.

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Blewbury's Water

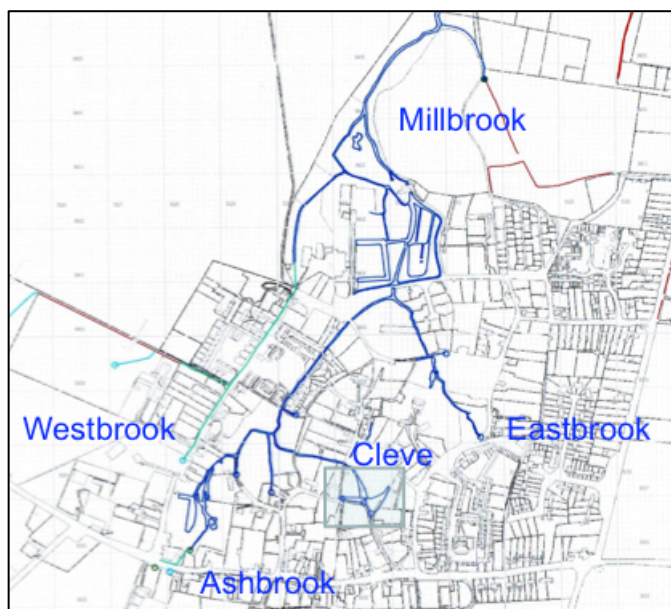
Jo Lakeland

The Millbrook

Blewbury is one of a string of villages that owe their existence to springs emerging along the base of the North Wessex Downs escarpment. They are spring-line villages, along the line where the chalk downs meet the clay. On a map you can see them stretching along the A417 from Streatley to Wantage, then along the B4507 to Swindon. The springs originate from rainfall on the downs, and in normal years they are perennial i.e. never dry up, so they have supported settlement for at least 4,000 years.

Blewbury is recorded in the Domesday Book as containing a church, 89 households and four water mills on the Millbrook. More recently farmers could rely on the springs for the important twice-yearly dip of their sheep. And in the 19th century a waterwheel was installed on the Ashbrook to generate the first electricity in the village.

Blewbury's springs are shown on the map as circles on the southern ends of all the brooks and along the raised south-west bank of the Cleve. The Westbrook is marked in pale blue because it now flows through a pipe under the pavement of Westbrook Street, but it can still be heard through holes in the kerb near to the village hall drive.



When the streams ran dry!

In the spring of 1992, Blewbury's streams and wells were dry and the Cleve was empty. Why? It was not the first time: a special meeting of the Parish Council was held in September 1934 because the wells along the London Road were dry. A month later, a parish meeting decided to ask for a piped water supply, and this was installed in 1937. Bore holes were also sunk during the 30s and 40s at Lid's Bottom (south west of Downside Farm) to supply Blewbury with water.

The water table was also very low in the hot summer of 1976, but as the chart on page 4 shows, Plentys' well became dry in the winter of 1991-92 whereas in an average year the depth would be increasing to a maximum level in March. Mike was very concerned about lack of groundwater feeding Blewbury springs, and with Bernardine Shirley-Smith formed a BVS Action Group to restore the springs and streams. A petition signed by 850 people was presented to Thames Water in February 1992 asking them to stop pumping the Blewbury boreholes as soon as possible. Investigations by the Action Group led to the conclusion: 'We believe that the drying up of the village streams is primarily a consequence of over-development and mis-management of the ground-water resources and is not due to natural causes.'¹

The group sent a petition to Thames Water asking them to reduce their pumping of our groundwater, which was signed by 850 Blewbury residents. The Parish Council also wrote to the National Rivers Authority, but the problem persisted.

Throughout the entire summer of 1992 the only stream with any water was the Eastbrook in Watts Lane, and the Cleve remained so completely dry that one of the riparian owners grew potatoes in it!

Our streams were flowing, but why?

The previous three years had been unusually dry, and Thames Water was taking water from several boreholes above Blewbury.

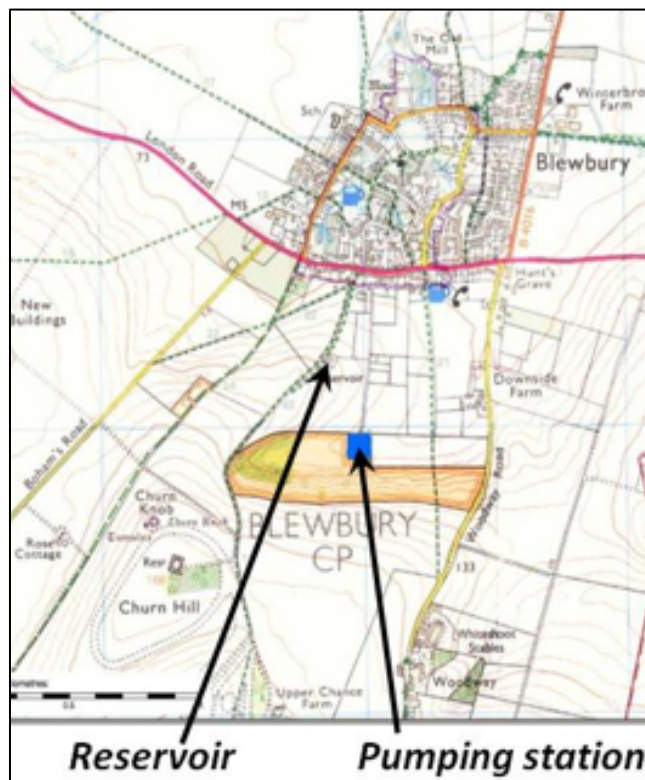
The March 1992 Bulletin stated that traces of carbon tetra-chloride² had been found in the Blewbury borehole, and the July/August bulletin reported that the concentration was steadily rising to a level at which Thames Water would need to take action to provide an alternative supply. This was even featured in the national press.

¹ February 1992 Bulletin

² The carbon tetrachloride came from use at Harwell during WWII

Thames Water decided to turn off the Blewbury borehole and connect the Blewbury reservoir to a high-quality supply at Gatehampton, near Goring, through a new pipeline between Aston Tirrold and Blewbury. The chart on page 5 shows that the water level in Plenty's well started to rise in September 1992.

So was it the BVS/Parish Council's actions that got Thames Water to turn off the Blewbury borehole, or was it the contamination? Probably both.



How your 'landfill' waste produces energy at Ardley

Angela Hoy

Just a year ago, in December 2014, a company called Viridor Waste Management opened a state-of-the-art £205M 'Energy Recovery Facility' (ERF) at Ardley, Oxfordshire. It's a few miles north-west of Bicester and close to the M40, a short distance north of the A34 junction.

Our visit to the ERF was arranged by the Energy and Environment Department of Oxfordshire County Council (OCC) as part of our training as Master Composters. There were almost 20 of us, far more than they usually get, and we stretched their facilities as we all had to don high-visibility jackets, helmets and gloves. After checking through security, the tour started with a short talk to learn about the facility, which is already paying back money to OCC through metal reclaimed during the process, recycled gases and the final product which is used as aggregate for road building, meaning

virtually nothing ends up going to landfill! The tour goes right through the incineration process, which is quite hot in parts and very noisy too, but fascinating.

The ERF processes approximately 300,000 tonnes per year of non-hazardous waste that otherwise would have gone to landfill and turns it into electricity. This covers 95%–100% of landfill waste.

The site covers 11 hectares, and has 260 km of electric cabling within the building, plus a further 9 km of cabling to connect the ERF to the National Grid. It operates for 24 hours a day, 365 days a year.

The facility has significant environmental, social and economic benefits for local taxpayers by producing 26 MW of electricity – enough to supply approximately 38,000 homes – as well as having the potential to run a district-heating scheme.

Energy produced by the waste treatment process is used to operate the facility itself, and the excess energy is fed into the National Grid.



What it does

The process begins with the delivery of residual waste, which consists of non-hazardous material left over after reducing, reusing and recycling as much as possible. The majority of the waste is sourced from Oxfordshire. Waste vehicles unload in the tipping hall, which is fully enclosed with a dust suppression system operated from the control room.

Two overhead cranes feed the waste into one of two furnaces where it is burnt at over 850 °C. Air is injected to ensure that the waste is fully combusted. Water is used to cool the combustion gases and is pumped into an economiser to create steam. A boiler then superheats the steam to 400 °C. The steam drives a turbine which powers a generator.

Some of the electricity (around 3 MW) is used to power the plant. The majority is exported to the National Grid – 26 MW, which is enough to power about 38,000 homes. Hot water and steam are also produced for district heating schemes.

Lime and carbon are added to remove acid gases and absorb heavy metals, dioxins, and PCBs (polychlorinated biphenyls).

Gases are filtered through bag filters to remove particles and this gives rise to a by-product known as Air Pollution Control Residue, which is removed from the site for processing. This involves using carbon dioxide for the manufacture of sustainable carbon negative aggregate.

Clean gases, steam and carbon dioxide are released from the stacks.

The emissions from the plant meet both local air quality standards and the requirements of the European Waste Incineration Directive (WID).

Ash from the incineration process is taken by Raymond Brown Aggregates, who have invested over £2M at the facility. They operate an on-site Incinerator Bottom Ash (IBA) processing facility which allows for the pre-treatment storage, treatment, long-term storage and sealed loading of the approximate 75,000 tonnes of IBA produced by the facility every year. This recycled IBA will then be exported for use as secondary aggregate in the construction industry.

Education

A state-of-the-art visitor and education facility has been developed on-site. Visitors aged 12 years and above can go on a tour of the plant. Younger visitors from the age of 8 can experience the Visitor Centre and visit the control room. Community groups, schools and businesses can visit to learn about the plant. The education section told us about ways we should all be avoiding sending reusable materials to landfill – with educational toys for kids to enjoy.

Viridor has an apprenticeship programme for people interested in working in energy recovery. The apprenticeship covers electrical, mechanical and instrumentation control and automation engineering.

We all enjoyed the visit immensely, and would recommend it to anyone to learn about how we can avoid waste. There is more information on the website of Viridor Waste Management, Ardley, at bit.ly/1IIy82W

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'The UK has claimed international leadership on climate change many times. But even a cursory glance at what's going on in energy policy shows that irrespective of the words, the concrete actions to reduce emissions are lacking. The UK is at real risk of failing to deliver a low-carbon economy because it is failing to support the technologies and measures that can do that. That failure would in turn mean it will fail to deliver on its long-standing commitments to address climate change.'

Dr. Bridget Woodman, Exeter University, Oct. 2015

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Thoughts of an angry Volkswagen diesel owner

Eric Eisenhandler

In 2011 Claire and I bought a VW Golf diesel. It was the sort of car John Richards and I had recommended on the Blewbury Energy Initiative website: www.blewbury.co.uk/energy/cars.htm

We were, and of course still are, concerned about carbon dioxide (CO₂) emissions. Modern diesels are no longer as noisy, slow or dirty as they used to be, and their low-ish fuel consumption means they also have low-ish carbon emissions. Diesels now have more than half of the new car market in the EU due to expensive fuel and taxes based on CO₂ emissions.

The other options available in 2011 didn't seem convincing to people living (like us) in a rural area. Petrol engines use more fuel and emit more CO₂ than a similar-size diesel. Petrol hybrids claim fuel consumption similar to diesel but do worse for rural driving, especially on motorways. Plug-in hybrids weren't widely available then. Electric cars have very limited range, there aren't enough recharging stations and recharging takes too long.

We knew that the 'official' EU figures for fuel consumption (and hence CO₂) were not realistic, but that applies to all sorts of cars. I didn't expect the Golf to achieve the claimed 67 mpg and it never has, but its 54 mpg overall, including short journeys and cold starts, is the best we've ever had. Realistic compilations of fuel consumption (e.g. Which? or HonestJohn) show typical discrepancies for most cars of 10–25% compared to the 'official' figures.



What about pollution? The main issue then was soot, which is widely considered to be carcinogenic. However, by 2011 the new Euro 5 standard had brought in soot filters, and I haven't seen any serious reports saying they are not effective. So in 2011 a modern, efficient diesel seemed like a good stopgap while waiting for a better solution.

Diesel engines do emit much more nitrogen oxides (NO and NO₂, together referred to as NO_x), than petrol. Since 2011, we have learned that NO_x is even

more harmful to the respiratory system than had been thought. But the EU NO_x emission limit has come down rapidly – see the table below. By Euro 5 it was much reduced, and in the current Euro 6 standard it is very close to modern petrol engines.

European engine emission standards

*mg/km = milligrams per kilometre

Euro standard	Date approved for new cars	Max amount of NO _x for diesel engine	Max amount of NO _x for petrol engine
Euro 1	31 December 1992	780mg/km*	490mg/km
Euro 2	1 January 1997	730mg/km	250mg/km
Euro 3	1 January 2000	500mg/km	150mg/km
Euro 4	1 January 2006	250mg/km	80mg/km
Euro 5	1 January 2011	180mg/km	60mg/km
Euro 6	1 September 2015	80mg/km	60mg/km

However, due to lobbying by the car makers, the EU test for NO_x emissions is not realistic. In the US, where for historic reasons few diesel cars are sold, both the limits and the test are much tougher.

Several years ago VW started a big push to sell its 'clean diesels' in the US. The scandal broke when tests there showed that in normal use VW diesels emitted vastly more NO_x than in the US (and EU) test results – not just the 10–25% typical of the fuel consumption/CO₂ tests, but by a *factor* of 10 or more times higher. It was deliberate fraud by VW: the engine software had been rigged to turn NO_x controls on for the tests and off in normal use. Why?

NO_x pollution is difficult to deal with. Modern 'clean' buses and lorries do it by injecting a urea/water mixture from a tank (which has to be refilled periodically) into the exhaust. Urea sets off a chemical reaction that converts NO_x into nitrogen, oxygen, water and small amounts of carbon dioxide. Many diesel cars have now adopted that system. But initially VW chose to use a different method called a 'lean NO_x trap' in the exhaust because it is simpler, smaller, cheaper and doesn't need to have litres of fluid topped up every few thousand miles. However, the 'trap' didn't work well and also has adverse effects on engine power and fuel consumption. So VW resorted to cheating.

The result for VW is catastrophic: 11 million cars, 1.2 million of them in the UK (VW, Audi, Skoda and Seat) need modifications, mostly to the software, and 400,000 of them (cars with 1.6 litre engines) need modifications. The effects on fuel consumption and performance aren't known yet. In addition, fines from governments and lawsuits for compensation from angry owners are likely.

The cars affected have Euro 5 certified engines; VW claims that their current Euro 6 models are not affected and comply with the EU standard. Some, but not all, current models now use urea injection.

Other makes of car are now being checked. Very few seem to satisfy the NO_x limits, with most emitting several times more than they should, though not as much as VW. The much higher than expected level of NO_x emitted by supposedly clean diesels is very likely a factor in the persistently high NO_x pollution in European cities and towns.

The EU tests for fuel consumption, CO₂ and NO_x emissions clearly need to be made more realistic. However, some major car manufacturers have lobbied to delay and to water them down, with strong support from the UK, French and German governments.

Diesel has relatively low CO₂ emissions. If NO_x emissions can be brought down in a sensible way to really comply with Euro 6, then diesel might still be an option as a 'green-ish' car solution until electric cars become more practical. But although we like our Golf, Claire and I won't be buying another VW.

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'The UK led the world with both the modern scientific revolution and the industrial revolution, and must lead again now on the creation of a safer, cleaner and more prosperous world ... Now is the time for the prime minister and the rest of his government to show leadership on this issue, by implementing effective domestic policies to tackle climate change and to support efforts overseas, including a strong international agreement [at the Paris UN summit] at the end of this year. ... The transition to a low-carbon economy offers enormous opportunities for better and stronger [economic] growth.'

Lord Nicholas Stern, July 2015

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Hedge-laying in Blewbury

John Ogden

The old craft of hedge laying is rarely seen these days. It is a labour intensive practice once widely used to keep hedges in a condition where they provided effective field boundaries to restrain cattle and sheep – but now largely ignored in modern, capital intensive agriculture. But it is a practice with considerable advantages for the environment: hedges which are allowed to grow unchecked become, eventually, spindly and weak with little of the density of vegetation favoured by nesting birds. And hedges which are kept trimmed but never laid

become sparse at ground level and fail to provide the habitat favoured by small mammals.



Processing the bushes and trees



Newly laid



Strong growth

In Blewbury, a group of volunteers, inspired by the enthusiasm of Alex Musson, have begun to revive the practice locally. The activity has been endorsed by Sustainable Blewbury who have provided funds to acquire the tools necessary to keep at least two teams of hedge layers occupied. Alex, together with John Ogden, have brushed up their skills with a course at the Earth Trust in Little Wittenham and are passing these skills on to a group of villagers, now fifteen strong, who are keen to take part.

The style of hedge-laying we are practising is a variation of the Midlands Style which has been developed particularly for beef farming – a style which needs to be stout enough to withstand the attention of a herd of bullocks! Our variation amounts to no more than the fact that we trim both sides of the laid hedge rather than the traditional practice of leaving the ‘brash’ pointing out into the field as an additional deterrent to livestock. Each region has its own style but the basic principles are the same: uprights are cut through to about two thirds of their thickness, then trimmed with a billhook and laid to an angle as you can see from the photographs: these are the pleachers. That slender attachment to the roots is sufficient to maintain the flow of sap which will encourage regrowth. Once the laying is complete stakes, most commonly of hazel, are driven in at one metre intervals and finally binders, again of hazel, are twisted and wound along the top of the hedge between the posts. It is this final process of staking and binding which gives the laid hedge great strength and stability.

During early 2015 we laid some hedge at Tickers Folly, close to the recreation area. During the next two to three months we plan to start again with the hedge alongside the cemetery and car park, finishing in early March to avoid disturbing nesting birds. One problem last time was finding sufficient good straight hazel for the stakes and binders, but this year we have got off to a good start by being given access to a sizeable hazel stand in Juniper Valley – for which very many thanks to Carol and Anthony Allen of Winterbrook Farm.

If you would like to join in, contact John (jogden@blewbury.net). All you’ll need will be thick gloves and immunity to the weather! We will be in touch with all volunteers as soon as we have dates fixed.

* * *

Ash dieback – is genetic modification the solution?

Jo Lakeland and Glen Meadows

Scientists have suggested that genetically modified ash trees could possibly replace the 80 million expected to die in the next 20 years from a deadly fungus.

The fungus, *Hymenoscyphus fraxineus*, also known as chalara, has already wiped out 90% of ash trees in Denmark. It was first confirmed in the UK in 2012 and is expected to wipe out 90% of the ash population, which is 20% of all UK trees.



Lesions (especially around side shoots) and crown dieback

Scientists at Queen Mary, University of London say that there is no hope of saving existing native ash trees from the dieback disease now spreading across the country, but a genetic modification (GM) solution could develop resistance faster than traditional breeding and start to repopulate woodlands within a few years. GM is one of six breeding techniques to replace the trees that have been presented by Oxford scientists to groups of specialists and members of the general public to gauge public opinion.

Richard Buggs, lecturer in biological sciences at Queen Mary, said: 'If we discovered that people did not want GM ash and would rather have no ash trees, there would be no point developing a GM ash, and we would pursue a breeding approach. Potentially, it could be much quicker to develop GM trees resistant to ash dieback: conventional breeding would take many decades.'

A survey of 1,400 people revealed a mixed reaction to the prospect of GM ash trees. The options with the highest acceptability all used different methods to breed tolerant ash. The least popular options were to let nature take its course with the disease, and trans-genetics, which would introduce a gene from another plant or animal into native ash trees. But one of the most popular options was a GM method called 'cis-genetics', which would only transfer genes between different species of ash tree.

GM trees are seen by some as a potentially lucrative development, able to speed growth and increase volume in plantations. But only three types of GM trees have so far been authorised for commercial use anywhere in the world, and little is known about how they might react in mixed forests.

Some ecologists and geneticists argue that the unregulated release of any GM trees in a forest or woodland could do massive damage, because a forest ecosystem is complex and biodiverse, and little is known about the natural interactions within it. Any attempt to engineer genomes by invasive methods could cause unexpected effects.

But others say that British trees like the ash face such a variety of pests that it is essential to try every possible method to save them for posterity. The Woodland Trust is working with DEFRA and the Forestry Commission to try to identify native ash trees that are resistant to dieback. It has planted 24,000 ash trees, gathered from all over the UK, to expose them to the disease to see which, if any, are suitable to be bred from. The trust's director urged caution: 'the test tube should be the last resort, only used when we have exhausted all the other options.'

A DEFRA spokesperson said: 'DEFRA is not developing GM trees. We want to ensure that the graceful ash tree continues to have a place in our environment. That's why we're protecting non-infected areas, managing affected plants and have invested over £21M into tree health research, including developing disease-tolerant ash trees through selective breeding.'

What is your opinion on this? Email to let us know at info@sustainable-blewbury.org.uk

[Based on an article by John Vidal in the Observer, 31 October 2015: bit.ly/1LOHKkD.]

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We welcome new members. If you are interested in getting involved please contact us at: info@sustainable-blewbury.org.uk