



GUILDFORD ENVIRONMENTAL FORUM

newsletter

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# Garden grabbing

*By Forum member James Mainwaring, a summary of his sixth-form project written last year*

GARDEN GRABBING is when one residential property is demolished and replaced with two or more residential properties, or when a residential property owner sells off part of their garden (front or back) and this land is used for additional residential property.

The reasons for such a practice stem from the economic benefit gained by the homeowners who sell off parts of their garden, and the developers who develop the land. Its origins arise within planning laws, politics, and the need for affordable family homes in a country whose population is increasing and whose housing infrastructure cannot accommodate it.

An activity with similar consequences to garden grabbing has appeared: the practice of putting hard materials such as concrete, decking and patios onto or into gardens, both front and back.

In this article I shall examine the causes and consequences of these practices, which are widespread throughout the UK.

## Causes

### 1. Planning laws

In 2000, early in the period of the Labour Government of 1997-2010, gardens were placed in the Brownfield planning category for the nation's planning policy, rather than being in Greenfield, as they were traditionally. Therefore gardens were moved into the same planning category as ex-factory land and other old industrial sites.

These changes to planning policy were drawn up by former Deputy Prime Minister John Prescott. He had done this as the United Kingdom was, and still is, in desperate need for new homes, and Labour's policy of increasing housing density in urban areas, by allowing and encouraging garden development, was intended to allow more families to gain access to affordable housing and ease the housing shortage. Whether this objective was achieved is debatable. Some have said it was not, because the housing that is built in garden grabbing developments is not affordable and is instead executive and luxury. Despite the economic recession, which has muted demand for housing land, fundamental concerns about the supply of land to meet housing targets still exist.

Undoubtedly, the fact that gardens were placed in the Brownfield planning category has been the main cause of garden grabbing development, because it was so easy for developers to obtain planning permission, and so hard for councils and local authorities to reject their plans.



## 2. Benefits

Although it was the change in planning laws that facilitated garden grabbing, in many cases development on gardens may be regarded as entirely appropriate, and there are many clear, definable benefits to such development, which are also causes of the practice. Firstly, these developments reduce the need to extend development into countryside and so breach the green-belts. Moreover, they allow the creation of new homes without the need for increased infrastructure provision such as roads, street lights, sewerage, mains water and electricity, and so such developments can be economically viable and preferable at a time when funds are limited.

In addition, garden development provides better utilisation of land in areas where people no longer demand large gardens due to lifestyle changes. Thus the infilling technique of garden grabbing is making the most of land in already urbanised areas, so as to minimise urban sprawl into greenbelt and countryside land. Garden development may also provide small sites which are appropriate for local developers who will employ local people, thus aiding the local economy, and reducing leakage to much larger development companies who may have no direct ties to the areas within which they operate.

Finally, garden sites are often favoured by developers because they are situated in established residential areas and often present fewer physical issues than Brownfield sites that are, for instance, old industrial and contaminated. Thus access to garden sites is much easier and there is little or no chance of contaminated soil or dangerous materials which would need to be removed, as happened at the Olympic Park in London, at much expense.

All these reasons make garden land development seem a sensible and economically viable activity, and show that in fact this practice may add significantly to housing stocks in ways that are sustainable and which meet the local housing needs. These reasons appear to build quite a strong argument for garden grabbing, or garden (land) development as it is known politically; but as we shall see later, there are also convincing arguments against this activity.

## 3. Garden developments

It is also appropriate to consider the causes of the second type of garden development identified above: the practice of putting hard materials onto or into gardens, both front and back.

To begin with, households in inner city areas, such as London, are paving over their front gardens in order for them to act as off-street parking bays for their household's cars. Such an activity stems from tougher parking rules and a lack of off-street parking for the terraced housing of the Victorian and Edwardian ages. This has been compounded by the immense increase in car ownership and the rise of the multi-car family.

Back gardens are also being plastered with patios,

water features and decking, replacing the traditional lawn and flower beds. This can be attributed to an attempt to avoid garden upkeep because people do not have sufficient time, whereas a patio can be laid and forgotten. It has been argued that this reflects the rise of television make-over garden programmes such as *Ground Force*.



Moving house is expensive. As a result many people are attempting to squeeze extra value from every square metre of land, by erecting sheds for storage, laying patios for outdoor dining and block-paving driveways.

A recent development within garden culture is the rise of the shed as a home working space, and this is adding to the above problems. Traditionally sheds are where lawnmowers and gardening equipment were stored, but now many companies offer 'sheds' which are dubbed garden rooms. These rooms are often modern and hi-tech, and can act as offices or living rooms, but they have almost exactly the same consequences as a patio.

This trend has also been encouraged by garden centres and DIY supermarket chains, who are pushing the idea of the need to make our gardens extensions of our houses, not just places for flowers and grass. There is money to be made in selling garden furniture, decking and patios.

## Consequences

### 1. The hydrological impact

Water uptake by plants and trees is reduced due to land clearance for development, and vegetation cover is replaced with concrete and asphalt. This reduces the interception of precipitation, meaning that water reaches drainage systems faster and reaches river channels faster. Moreover, the use of hard impermeable materials for housing development and patios or decking or garden rooms increases runoff as there is much less friction, and so again rainwater will reach drains and river channels much more quickly than in a more natural environment.

These hard surfaces also block infiltration and

percolation through soil sealing, and this could possibly have a structural impact on buildings. For instance, if a house was surrounded by an impermeable patio, then the soil under the house may not receive adequate moisture to keep it at its natural volume, and this could cause subsidence.

With more houses come more drains, often very efficient at taking water to river channels. When combined with increased runoff, decreased interception and decreased infiltration, water enters river channels very quickly after it has fallen as rain. This has the effect of making rivers have more flashy responses to precipitation and thus more likely to flood, and in fact reach a higher flood level. As a significant proportion of our nation's infrastructure is built on flood plains, in the long run, if not halted and controlled, garden grabbing could have serious consequences.

## 2. Habitat destruction

With the removal of trees, hedges, lawns and flowerbeds, the habitats of many birds, animals and insects are being destroyed, and these organisms are either migrating or dying. As a result biodiversity is reduced and natural cycles and processes, such as seed distribution and the nitrogen cycle, are being impacted upon.

## 3. Loss of green space

Gardens, like parks, are the green lungs of cities and urban areas. They improve air quality, control air temperature and flood risk, and provide a haven for both humans and wildlife. This reduction of green breathing space can affect people's mental states and impact on their ability to unwind in a society which is becoming more and more stressful to work and live in. Communities and households are also being robbed of safe places for children to play and get fresh air and lead healthy lifestyles.

## 4. The "heat island" effect

The "heat island" effect comes about when urban areas are significantly warmer than rural areas, with this difference in temperature being most obvious at night and with little wind. The main cause is the modification of land by urban development, using materials such as concrete and brick which absorb heat and then release it at night or during cold spells. Thus, as garden grabbing is adding more houses and buildings to urban areas, this effect is becoming even more pronounced. London is a major example of an "urban heat island". There were fears that this effect was adding to global warming, but further research seems to have disproved these theories.

## 5. More CO<sub>2</sub> emissions

Vegetation, such as trees, bushes, grass and plants, absorbs carbon dioxide during photosynthesis. As the vegetation is removed, less carbon dioxide is being absorbed, and so more is rising into the upper atmosphere to add to the greenhouse effect.

## 6. Greater population density

Increased population density leads to an increased demand on service provision like education, health and leisure, and also generates increased amounts of traffic. In areas where garden grabbing is prevalent, both of these are serious matters.

Moreover, this increased population density can destroy the quality of suburbs by damaging the character of particular areas, which were once open, green and spacious, but are now becoming more tight, crowded and urban. Garden grabbing can degrade the architectural character of areas, as well as placing strain on the local infrastructure.

Naturally then, garden grabbing can create tension between neighbours, particularly if some of them are having their views spoilt by the developments. This in turn creates increased friction between established residents and the newcomers, who are moving into the new properties.

## And in Guildford?

South East England is where the highest proportion of new dwellings were built on previously residential land: garden grabbing. Furthermore, Guildford is a 'garden grabbing hotspot', with 56% of new dwellings having been built on previously residential land between 2005 and 2008. Using geographical information systems, and in particular the satellite imagery of Google Earth which allows views from different times to be analysed, I have been able to identify a number of examples of garden grabbing within the town of Guildford, and with some of these developments I have investigated the associated planning applications and permissions. These are included in my full article. Please contact me for a copy: [james.mainwaring@hotmail.co.uk](mailto:james.mainwaring@hotmail.co.uk)

On 9 June 2010, less than a month after the new Conservative and Liberal Democrat coalition came to power, Greg Clark, Minister of State for Decentralisation and Planning Policy, announced that councils and communities would be given new powers to "prevent the destructive practice of garden grabbing", and this would be achieved by removing gardens from the Brownfield planning category and putting them into the Greenfield planning category, where he argued they rightfully belong.

The driver of the change was to enable councils to prevent any unwanted development on gardens where local people object, and thus protect the character of their neighbourhoods. Furthermore, Greg Clark scrapped the minimum housing density target, which had been partly blamed for the lack of family-sized homes and flats for local people. So town halls and local communities are now able to decide what new homes are best for their area.

As a result, we are likely to see a decline in garden grabbing development in the future.

## The carbon intensity of different forms of electricity generation

No form of electricity generation is carbon free. The main ways to produce significant quantities of low carbon electricity at present are wind and nuclear. The Parliamentary Office of Science and Technology report *Carbon Footprint of Electricity Generation, draft update, 2011* shows the following carbon emissions from different sources of electricity as follows:

- Coal:** 900 gCO<sub>2</sub>eq/kWh within a range of 780 to 1090 gCO<sub>2</sub>eq/kWh
- Gas:** 488 gCO<sub>2</sub>eq/kWh within a range of 400 and 640 gCO<sub>2</sub>eq/kWh
- Onshore wind:** 15 gCO<sub>2</sub>eq/kWh within a range of 9 to 25 gCO<sub>2</sub>eq/kWh
- Offshore wind:** 11 gCO<sub>2</sub>eq/kWh within a range of 9 to 13 gCO<sub>2</sub>eq/kWh
- Nuclear:** 19 gCO<sub>2</sub>eq/kWh, with a very broad range of estimates, most below 100 gCO<sub>2</sub>eq/kWh, the high level of uncertainty depending on the grade of the uranium ore, the uranium enrichment process, the reactor technology and the estimation methodology.

Nuclear provides reasonably constant base load electricity, but is inefficient in that valuable heat energy is wasted. Wind at the local level is intermittent, but on a wider geographical scale makes a very substantial and increasing contribution to our electricity needs. Wind is a distributed form of electricity, which is an advantage, quick to build and relatively inexpensive.



### Dunsfold Park Solar Farm

In our June newsletter we reported that the 2MW solar PV farm at Dunsfold Park was going ahead. Phase I, comprising 150 kW, was satisfactorily completed in July, as required to get the project registered for the Feed in Tariff (FIT) payments. The photo shows this stage of the project.

Phase II, the balance of 1.85 MW, has to be completed by 5 September.

## Guildford's traffic scandal

I think everybody agrees that traffic is the biggest blight damaging Guildford. Analysis of traffic congestion across Europe in 2011 by satnav specialist TomTom shows that Guildford falls within the 50 most congested "cities" in Europe. Guildford sits at 42nd place above much bigger UK cities and above Cologne in Germany. This is an appalling statistic.

The UK is the most gridlocked country in Europe, with 15 cities and one town in the worst 50 and congestion costing the UK economy a massive £8 billion a year. Successive UK governments at all levels have watched this situation develop and done nothing to price road use or do enough to improve public transport.

Guildford's business community is up in arms and some money has been identified to improve access to the Research Park. But the answer surely is not to try and build our way out of this mess but to halt future housing, business and retail development in Guildford, at least until the congestion problems are sorted. It is completely unfair to subject residents to the escalating noise and air pollution caused by traffic.

Too many people charged with solving this problem never use public transport, or walk to work or to the shops, let alone cycle. These modes of travel are the solution to reducing congestion – but now we learn that rail fares are to rise by 8%.

## UK's emissions not on target

Despite all the talk of being a world leader, Britain has failed to cut carbon emissions across a range of areas and would risk missing its first set of targets if it were not for the recession, according to the UK Climate Watchdog. After adjusting for cold weather, UK emission levels remained broadly flat in 2010, whereas annual average reductions of 3% per annum are needed to meet the first of the four carbon budgets set under the 2008 Climate Change Act.

Tory MEPs notoriously voted down a widely-backed proposal in the European Parliament to increase the EU's 2020 greenhouse gas reduction target from 20% below 1990 levels to 30%. This was in defiance of the Coalition's agreed position.

Investigations by the *Guardian* and Greenpeace have suggested that Tory MEPs were influenced by meetings with fossil fuel companies. They met four times more frequently with these companies than with companies developing low-carbon energy solutions. Chris Huhne, the Energy and Climate Change Secretary, has ordered a private enquiry into these allegations.

## Peak phosphorus

Phosphorus is an essential nutrient for all plants and animals, but supplies are dwindling and are expected to peak in 2033. In response, fundamental change will be needed in three areas: what we farm, what we eat and how we deal with human waste. Currently, only about 10% of the 3 million tonnes of phosphorus excreted by the global human population each year is returned to agricultural soils. (Source: *Living Earth, Spring '11*)

## FACTS & FIGURES

### Tigers – 1

Between 1996 and 2006, the tiger's habitat area shrank by 40%.

### Tigers – 2

Tiger poaching is the third largest form of organised crime worldwide.

### Tigers – 3

There are more tigers in captivity in Texas than there are in the wild.

(Source: *WWF Action, Sept '10*)

### And orangutans?

Oil-palm monoculture covers almost 10% of Borneo.

(Source: *BBC Wildlife, Aug '11*)

### Disturbing trails

Aeroplane contrails are causing more global warming than the carbon dioxide they release, say German scientists. The thin cirrus clouds spread out, trapping long-wave radiation and warming the atmosphere.

(Source: *BBC Focus, July '11*)

## Get composting today...for a greener tomorrow

Whether you're a keen gardener or just want to choose the greenest, most natural way to deal with your food and garden waste, composting is the perfect solution.

Grass cuttings, dried leaves, twigs and vegetable peelings are just some of the ingredients that can go into a compost bin or heap to make peat-free compost – ideal to use in potting or planting in your garden or allotment.

Getting started is easy. All you need is a compost bin or a small space in the garden to create a heap. Then just follow our easy guide to creating your own supply of natural food for your garden.

### Why compost?

Compost is a natural, nutrient-rich food product for your garden. It will help improve soil structure, maintain moisture levels, and keep your soil's PH balance in check while helping to suppress plant disease. It will have everything your plants need including nitrogen, phosphorus and potassium and will help buffer soils that are very acidic or alkaline. Compost improves your soil's condition and your plants and flowers will love it!

Home-made compost is natural and peat-free which means it is good for the environment outside your garden too. It reduces the need to buy peat products, which have been commercially sourced and extracted from peat bogs, resulting in the release of the carbon stored in them.

### Recipe for success

#### RIGHT INGREDIENTS

##### Greens

Tea bags  
Coffee grounds  
Vegetable peelings  
Salad leaves  
Fruit scraps  
Grass cuttings  
Old flowers  
Dead plants

##### Browns

Dried leaves, twigs  
Wood chippings, straw  
Crushed egg shells  
Vacuum bag contents  
Cereal/egg boxes  
Toilet/kitchen roll tubes  
Scrunched up paper

#### WRONG INGREDIENTS

Cooked vegetables  
Meat  
Dairy products  
Diseased plants  
Dog mess or cat litter  
Nappies



### A step-by-step guide

- 1. Find the right site.** Site your bin or heap on bare soil. If space is limited, put your bin on concrete, tarmac or patio slabs, but make sure there's a layer of soil or existing compost on the bottom so garden creatures can colonise.
  - 2. Add the right ingredients.** Fill your kitchen caddy with the right ingredients such as tea bags, taking care not to compost cooked food, meat or fish.
  - 3. Fill it up.** Empty your kitchen caddy and your garden waste into your bin or heap. A 50/50 mix of greens and browns is the perfect recipe for good compost.
  - 4. After 9-12 months.** The ingredients you have put in your bin or heap should have turned into a dark brown, earthy smelling material at the bottom of the bin, which can be dug out, with the newer material being left.
  - 5. Ready!** Once your compost resembles thick, moist soil and smells very earthy, it's ready to use.
  - 6. Collect the compost.** Lift the bin slightly or open the hatch at the bottom and scoop out the fresh compost with a garden fork or spade. If you have built your own, simply rake out the ready compost.
  - 7. Use it.** And watch your garden bloom. Compost can be used for all types of planting needs – vegetable plants for allotments; general potting (if mixed with something like ordinary soil); or flowerbeds and enriching new borders by mixing in existing soil.
- Moisture.** It's important to get the balance right. Too wet and the compost becomes slimy and too dry and composting is very slow.
- Air.** Introduce air into your bin either by using a garden fork to mix the material, or add more 'browns' such as scrunched up paper and card.
- NB: Those minibeasts that make your compost need water and air just like we do.*

To find out more about how to build yourself a compost heap, or to buy a bin starting from only £14.00, visit [www.surreywastepartnership.org.uk](http://www.surreywastepartnership.org.uk) or call 0844 571 4444. You'll find lots of other helpful tips and information there too.

# Bees and other big business

Raymond Smith

This is the text of one of a series of illustrated posters produced recently by Guildford Environmental Forum, which can be downloaded from our website as pdf files.

What we think of as all the world's economy, the money economy, is just the tip of an iceberg. Most of the work is done for us, cleaning the atmosphere or water, for example, is done for us without any money changing hands. The natural world – wildlife, is vital for our (human) survival. Insect pollination is a prime example of this.



Raymond Smith

In a consultation paper last year the government gave a figure of "£440m per year" as the UK cost of the decline in pollinators. However, when estimating the cost of losing the resources provided by the natural environment we need to estimate the replacement cost of providing those services by other means. The cost of hand pollinating all the crops that are currently insect pollinated would be enormous.

The earliest plants were pollinated by the wind, and some of our current food crops, essentially cereals, use this approach. It is more resilient in that it does not depend on other species, but it is very wasteful for the plant as far more pollen has to be produced to ensure that enough reaches other plants. This is less of a problem when humans plant fields of single crops.

When the insect-pollinated plants, known as angiosperms, evolved is still open to debate. It is generally taken to be about 90 million years ago, though recent discoveries imply as long ago as 140 million years. This is still well through the evolution of insects – they have been around for over 350 million years. Insect pollination may have evolved from wind-pollinated plants producing a sugar based, sticky substance to bind any pollen that reached it, and this became an attractive food source for insects. It has been suggested that some insect pollination took place far earlier than is due to nectar seeking, as some insects may have visited plants to eat the pollen.

Angiosperms form 80 percent of plant life on Earth and provide most of our cropped vegetation.



Raymond Smith

## Do bees have the answer?

Using many samples of honey from across the UK, researchers at Cardiff University and the National Botanic Garden of Wales (NBGW) hope to identify plants that can help fight antibiotic-resistant bacteria such as MRSA and *Clostridium difficile*. These bugs are a huge problem in hospitals. If the researchers identify honey containing microbial activity that kills off these bacteria they will use DNA analysis to identify what plants the bees visited.

The NBGW has a detailed biological record of every Welsh flowering plant so a match can

be made. The bees' hard work will hopefully lead the researchers to plants with powerful antibacterial properties.

Les Baillie, Professor of Microbiology at Cardiff University, said: "We are running out of ways to treat bugs like MRSA. We're living with the legacy of the past – the inappropriate use of antibiotics through buying them on the internet and using them routinely in animal feed."

Apiarists are being asked to submit samples of their honey.

John Bannister

### Clearing the ground

When the site of an old refinery in Essex was cleared for redevelopment, a total of 24,000 grass snakes, adders, common lizards and slow-worms was moved to nature reserves in Wiltshire. (Source: *BBC Wildlife*, May '11)

## FACTS & FIGURES

### Ravens on our patch

In a letter to *BBC Wildlife* in May, Rosy Jones from Epsom Downs says: "I thought you may be interested to know that ravens have recently been seen a lot in Surrey, mainly around the Guildford area (notably Pewley Down and Puttenham Common), but also in the Pyrford and Surrey Hills area." (Source: *BBC Wildlife*, May '11)

### Pest control

Plans were approved in 2010 for the controlled release at test sites in England of a tiny insect that eats only Japanese knotweed. It stunts the plant's growth, allowing others to outcompete it. Knotweed can literally wreck buildings and transport systems. Millions of pounds have already been spent on its removal, and it has taken several years to clear it from two of the 2012 Olympic sites. (Source: *BBC Focus*, May '10)

### Water use

It takes 7 litres of water to make a 1-litre plastic water bottle. (Source: *Earthmatters*, Spring '11)

# BIOFUELS

## SILVER BULLET OR GREENWASH?

by Forum member Robert Palgrave

### Part 1 of 3 parts

IN THIS SET OF THREE articles I shall be considering the question – should liquid biofuels be used to help mitigate climate change and resource depletion? It's an increasingly controversial question as government policies promoting ever greater use of bioenergy take effect, and the consequences for the rest of the world become clearer.

Bioenergy is energy obtained from burning material of recent biological origin, such as wood, vegetable oil, used cooking oil, corn ethanol, and gas from digested food waste etc. Biofuels are the liquid form of bioenergy, also called bioliquids when burnt to generate electricity.

Biofuels are already in every litre of fuel we buy for our cars. Commercial flights will soon be powered in part by 'bio-kerosene', and oil-fired power stations burning vegetable oil such as palm oil have planning permission in the UK, and are operational in Italy and Germany.

Biofuel proponents argue that we can safely replace a proportion of our fossil fuel usage with 'sustainable' biofuels made from crops and various forms of waste, reduce carbon emissions and eke out fossil fuel reserves.

Oponents say that using crops for fuel already worsens food availability and raises prices – morally questionable at best today given the inequities of the global food market, and unthinkable in a future world with up to 50% more mouths to feed. They point to the devastating effect on biodiversity, and on indigenous peoples of forests cleared to increase agricultural production, and question the truth of claimed greenhouse gas savings.

### Climate Change or Peak Oil?

Pinning down whether climate change or 'peak oil' triggered the current rush to biofuels is not easy, but biofuels have long been advocated as a means to protect against the vagaries of the global oil market. In possibly one of the first 'official' recognitions that fossil fuel reserves cannot last forever, the US Geological Survey announced in 1920 that "oil was running out".

This had already been anticipated by leading scientists. Talking in 1912, Rudolph Diesel said: "*The use of vegetable oils for engine fuels may seem insignificant today, but such oils may become, in the course of time, as important as petroleum...*". And Alexander Graham Bell said in 1917: "*Alcohol makes a beautiful, clean and efficient fuel... Alcohol can be manufactured from corn stalks, and in fact from almost any vegetable matter capable of fermentation... We need never fear the exhaustion of our present fuel supplies so long as we can produce an annual crop of alcohol to any extent desired.*"

Harold Hibbert of Yale University, a chemist working on producing alcohol from cellulose, pointed out that the 1920 USGS oil reserve report had serious implications and was a justification for his work. "*Does the average citizen understand what this means?*" he asked. "*In from 10 to 20 years this country will be dependent entirely upon outside sources for a supply of liquid fuels... paying out vast sums yearly in order to obtain supplies of crude oil from Mexico, Russia and Persia.*" He was wrong on the timescale at least – oil reserves and production rates soared and gasoline ousted ethanol as the standard fuel for motor transport.

The USA's current drive to use ethanol for up to 15% of their gasoline is almost certainly a response to a more recent assessment by their military that the US is now becoming dangerously dependent on oil imports.



**"It is not a good policy to have these massive subsidies for [US] first generation ethanol,"** said Al Gore, speaking at a green energy business conference in October 2010. **"First generation ethanol I think was a mistake. The energy conversion ratios are very small."**

Conversely, in Europe the primary motivation appears to be to reduce carbon emissions; although a cynic might suggest the farming industry and its agrochemical cousins smelled big money in biofuels, and pressured governments to set targets and give subsidies.

We have to think global to understand biofuels at the scale they are being envisaged. Britain and the EU are already a significant net importer of biofuels (the UK brings in around 80%) and the proportion of our imports is unlikely to reduce as volumes increase. Put simply, our biofuels are cheaper from areas where crop yields are highest, where land and labour are cheap and where governments see biofuel production as a means to boost their economies through increased exports.

In contrast, the USA mostly grows its own biofuels; although recently it has started to import Brazilian sugar cane ethanol. Home-grown biofuels are not free of consequences however. The 2008 'tortilla riots' in Mexico resulted from a steep rise in the price of corn as US maize production switched to ethanol and exports dropped sharply. And the US food industry is frustrated by the rising prices of corn used in food for both humans and livestock.

## Global energy consumption

An assessment was published recently saying that mankind uses energy at an average rate of 15 Terrawatts, and with a more prosperous population of 9 billion, we could be using 50 TW in 2050. [A Terrawatt is  $10^{12}$  watts or a million million watts.] In the richest country on earth, some individuals are consuming energy at a rate of 50,000 watts. Apparently that is the work done by 24 horses galloping continually.

Fossil fuels supply most of our energy of course, not horses. Can we run the global economy on alternative energy sources - such as wind, solar, marine, biomass and biofuels - keep the lights on and avoid runaway climate change?

Commenting on the possible role of bioenergy, Timothy Searchinger (Lecturer in Public and International Affairs at Princeton) said, *“The key issue is scale. Even if we used every piece of wood on the planet, every piece of grass eaten by livestock, and all food crops, that much biomass could only provide about 30 percent of the world’s total energy needs.”*

It should not be a surprise that biomass can only replace a small fraction of our energy consumption. Fossil fuels are ‘old’ biomass that took millions of years to accumulate. No one could deny that we are consuming them at a far faster rate than they were deposited.

This is because the process of photosynthesis, which creates vegetation and hence most biomass, is very inefficient in capturing solar energy. David Mackay in *Sustainable Energy without the Hot Air* comments that the most efficient plants in Europe turn about 2% of solar energy into carbohydrates, but modern solar PV panels can be up to 20% efficient in converting solar energy to electricity. In order to make use of the stored solar energy in biomass, other energy inputs are also needed to grow, harvest, process and transport the crops and resultant fuel, meaning the end-to-end efficiency - from sun to tank - is more like 0.5% at best for plants grown in Britain.

The amount of biomass required to replace a significant proportion of the fossil fuel used in transport runs into millions of tonnes, and producing enough biomass to make much of a difference therefore needs a lot of land. The area needed is less if biomass is grown in tropical or sub-tropical areas because of the significantly higher yields. For example, a hectare of oil palm plantation can yield 5 tonnes per year of food grade palm oil, whereas oilseed rape in Britain would only give up to 1.5 tonnes per hectare per year.

Significantly greater yields come from woody plants, or from conventional crops such as cereals if the straw can be used. Greater utilisation of such materials as a source of energy depends on the development of second-generation biofuels. Even if these higher-yielding methods do come to market, land availability still sets limits to what may be produced.

To meet the 2020 EU target for biofuels in road transport, for example, would require an area of around 26 million hectares dedicated to growing oilseed rape - nearly three times the area of all agricultural land in the UK, and approaching a third of the total EU arable land.

## UK and EU Government bioenergy policy

Surprisingly, given these physical, biological and chemical constraints, governments and businesses appear to believe that bioenergy should play a very large part in the so-called low carbon transition (the EU) and as a response to peak oil / oil price rises (the USA).

A recent report for the UK Department for Energy and Climate Change suggested that by 2030, between a half and three-quarters of Britain’s *total primary energy* requirement could come from bioenergy. This is an extremely rapid step-up from the aspiration for 2020 - that bioenergy should provide half to two-thirds of our *renewable energy*. It’s even more remarkable given that we currently get just 3% of our electricity, 0.6% of our heat and around 3.5% of our road transport energy from biomass, biofuels and biogas.

The 2009 EU Renewable Energy Directive (RED) requires the UK to source 15% of its overall energy, and 10% of the energy used in transport, from renewable sources by 2020. It does not prescribe specific targets for bioenergy use in other sectors like heat, power and aviation. But ‘sustainable’ bioenergy used in those sectors counts towards the overall 15% target, and is allowed to be subsidised.

## EU Renewable Energy Directive (RED)

For road transport specifically, the UK and other EU countries have instigated policies to progressively increase the use of biofuels to meet the RED target of having 10% of energy come from renewable sources in 2020. Renewable electricity in cars (and renewably produced hydrogen) can also count towards this target but, realistically, biofuels and some biogas will meet the bulk of the target. There are no targets beyond 2020, but if road transport is to make a fuller contribution to overall decarbonisation, it is very likely that policy makers will be looking to go well beyond 10%.

The RED also sets out mandatory sustainability criteria for biofuels. These include that biofuels must deliver a greenhouse gas saving of at least 35% (rising to 50% in 2017) and must not be sourced from areas of high biodiversity, or from high carbon soils, such as rainforests or wetlands. Only biofuels meeting these sustainability criteria can counted towards targets or be given financial support in the form of subsidies.

As part of the RED, the European Commission must also monitor and report every two years on the overall impact of biofuels policy and increased demand on social sustainability. This will include reporting on the availability of foodstuffs at affordable prices. If the report - the first one is due in 2012 - shows it is necessary, the EC must take corrective action; although the RED does not clarify how the EC decides that action is necessary, nor what the corrective action might mean.

In our December 2010 newsletter, **Lucy McSherry** outlined the proposals for a new waste treatment facility – an Eco Park – to be constructed at Shepperton. Planning permission has now been granted, though subject to referral to the Secretary of State for Communities and Local Government who will advise if he intends to review the permission.

Here Lucy explains the benefits it will bring.

## The Eco Park

THE ECO PARK proposal is part of Surrey County Council's 'World Class Waste Solution', which was adopted in February 2010 and whose aims include:

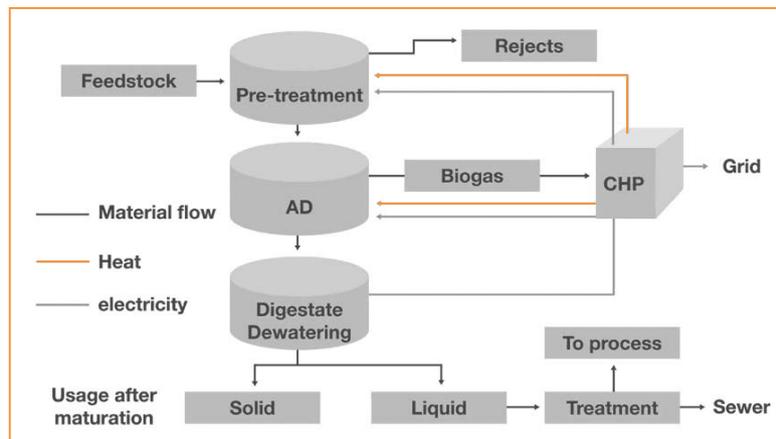
- Reducing the levels of household waste by at least 15,000 tonnes annually
- Increasing recycling rates to 70%
- Producing renewable energy from residual waste which cannot be recycled
- Achieving zero waste to landfill
- Improving operational efficiency, providing cost and carbon benefits

If built, the Eco Park will produce renewable energy from food waste and rubbish that cannot be recycled. The Eco Park is the first of its kind in the UK and will be a unique co-location of anaerobic digestion and gasification.

According to Surrey County Council, the Sita development, at the site of the existing community recycling centre at Charlton Lane in Shepperton, will help it towards its aim of eliminating the use of landfill, which costs Surrey taxpayers £600,000 every month in taxes alone.

### TECHNOLOGY OVERVIEW

#### What is anaerobic digestion?



Anaerobic Digestion (AD) is not a new technology; it has been in use since the 1800s and is widely used throughout the UK. AD is a process in which biodegradable material, such as food waste, is broken down by micro organisms in sealed, airtight containers in the absence of oxygen. The process produces biogas – which is converted into electricity – and digestate, which is the mass left over when digestion is complete. It can be used in place of artificial fertilisers and peat. The biogas is a mixture of 60% methane and 40% carbon dioxide which can be combusted to produce heat and electricity or both, and can also be cleaned up and injected into the grid or used as road fuel.

AD can be used to process food and agricultural waste. According to the Renewable Energy Association, if all the agricultural waste that is produced were treated in an AD plant it would

generate twice the total energy requirement of the agricultural sector. (<http://www.r-e-a.net/biofuels/biogas/anaerobic-digestion/ad-energy-balance>)

The AD facility will process 40,000 tonnes of food waste a year and generate electricity. SITA Surrey are proposing to use wet AD technology, where food waste is mixed with water and put through the facility.

The building is sealed, as are all the large containers where the process takes place, to ensure that odours are strictly controlled.

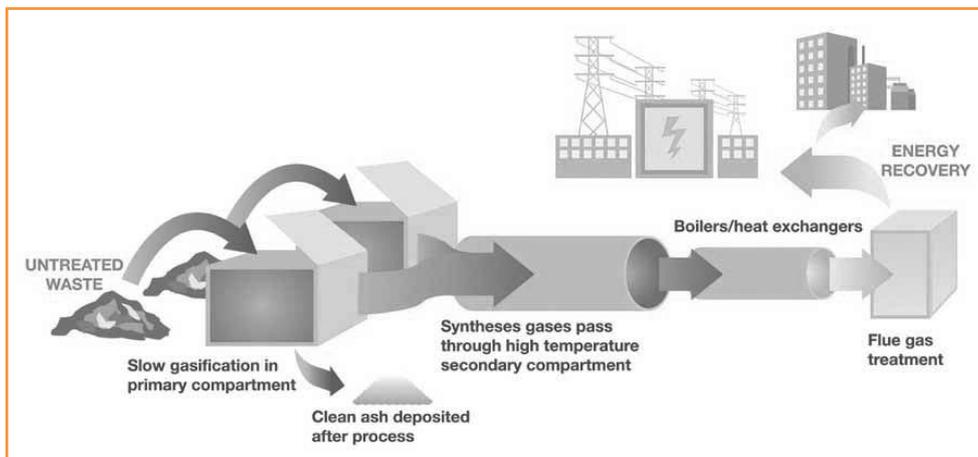
Surrey County Council is working with the county's district and borough councils to introduce separate food waste collections for residents.

The Government has recently launched the Anaerobic Digestion Strategy and Action Plan, outlining the commitment to increasing energy from waste through AD. Key actions in this Government's

strategy include guidance on the cost and benefits of AD to developers and local authorities, evidence on the value of digestates, developing skills and training for AD operators, and highlighting 'best practice' projects that deliver community benefits.

This highlights the Government's support for this sort of technology to deal with the organic portions of the waste stream. (<http://www.biogas-info.co.uk/index.php/news-archive/89-government-publishes-waste-policy-review-and-ad-strategy.html>)

### What is batch oxidation system (BOS) gasification?



SITA Surrey are proposing to use batch oxidation system (BOS) gasification. In this process, waste is heated in compartments in reduced levels of oxygen to temperatures above 650°C and transformed into burnable gas (syngas) and ash. The syngas is burnt in a secondary chamber. This produces hot flue gases, which are then taken to a boiler where steam is raised for the production of electricity.

Unlike typical thermal treatment methods, the BOS gasification reactions occur at relatively low temperatures under quiescent conditions. The manufacturers of the gasification process claim

nearly 100% burn-out of the waste and that the by-product ash is sterile with minimal residual carbon. (<http://www.enerwaste.com/bos.html>)

The facility at Charlton Lane will treat 60,000 tonnes of residual waste a year. It will produce enough energy to power thousands of homes, as well as sufficient electricity and hot water for the site. The process is controlled and governed by an Environment Agency Environmental Permit, which monitors emissions. SITA Surrey have applied to obtain a permit and a decision is expected by the end of August this year.

## BENEFITS

Surrey County Council outlines the potential environmental benefits of the Eco Park development and included a number of key points:

- Reduce material to landfill and the emissions associated with this method of disposal.
- Renewable energy generated – both through the waste treatment technologies and also the solar panels they are proposing.

Extensive landscaping to encourage biodiversity, including additional grassland and native woodland planting along the eastern edge of the site. As part of the landscaping element of the Eco Park proposal SITA Surrey are also submitting an application to re-route an existing footpath through the additional land they purchased. The decision on this application is expected in February next year.

## NEXT STEPS

Subject to the Secretary of State referral and the required environmental permit and permissions, work would begin on site by the end of this year. It is anticipated that the Eco Park will be operational by the end of 2013.

Concurrent with these steps will be the development of detailed design (to blend in with its Green Belt surroundings), ahead of construction getting underway at the end of 2011/beginning of 2012. Early works will include improvements to the community recycling centre entrance and bulking facilities, along with any landscaping that is

appropriate for that time of year. Key stages of the building work will be:

- Laying roads and car parking areas
- Site clearance, foundations and drainage works
- The removal of the waste transfer station building, meaning that builders and traders will no longer be able to tip their waste inside it. Alternative arrangements will be publicised in advance of changes, however householders will be able to use the community recycling centre as normal
- Installation of equipment including the anaerobic digestion and gasification facilities

Surrey is blessed with talent: following our two entrepreneurs featured in the June newsletter, here is a third . . .

## Entrepreneurs – 3 Harvest Wood Fuels

On 23 June a few Forum members visited Harvest Wood Fuels at its large site near Tilford and were shown round by Managing Director, James Little.

James, who has been the inspiration behind the success of the Surrey Hills Wood Fuel Group, has had a determined vision for several years to set up wood pellet production here in Surrey – not an easy thing to do given the capital costs involved, the processing knowhow needed and the relentless competition from imports and large UK producers. However, James sees a future for wood pellets in the domestic and small business renewable heat markets and despite setbacks he is on his way to achieving commercial success.

On our visit we saw the sequence of steps starting with sawdust, purchased locally from both hard and softwood saw mills or small diameter round wood, cleared from the local heathland, air dried and chipped on site. Sawdust or chip is then hammer-milled and dried in a wood-fired flash drier, and pressed through an Italian P-Systems pellet press. The press they are using is owned by Pelletech, in Kent, with whom Harvest are in a joint venture. There are no additives used to make pellets; under pressure the lignin in the wood binds the sawdust together.

James also makes bulk deliveries of up to 20 tonnes a time in blower trucks or bagged deliveries of a tonne on a pallet in 10kg bags. Currently there is a production capacity at the site of 1,500 tonnes a year of wood pellets. He has plans that could increase his production to 3,000 tonnes a year. In the meantime he has formed a partnership with Verdo Renewables Ltd, a subsidiary of a Danish company, to supply him with wood pellets from their 55,000 tonne a year pellet plant opened in Andover in April this year. Verdo have a similar sized plant in Grangemouth, Scotland. Ninety per cent of Verdo's

production is currently exported but as the UK market for pellets increases they will divert production. James is helping to build the UK wood pellet market in our area.

Wood pellet boilers are controllable and fully automatic much like a gas boiler. Pellets are poured or blown into a hopper on top of or adjacent to the boiler and are fed by gravity, Archimedes screw auger or vacuum transfer to the burner. Wood pellets provide a much denser form of energy than wood chips or logs and have a higher calorific value per kilogram due to the very low moisture content (mc) of 8% (compared to an mc of 20-30% for wood chip or seasoned logs).

Harvest Wood Fuels has plans for a new building at the site and a wood gas CHP plant to provide heat for drying, on-site electricity and grid exports of electricity. The CHP will qualify for both ROCS and RHI payments. The biomass gasifier will be supplied by Thompson Spaven, London.

The existing showroom at Harvest Wood Fuels is bright and airy with a full range of wood products including briquettes, pellets, logs and charcoal, all UK sourced. It is well worth a visit if you are thinking of installing a wood pellet boiler or stove (there is an operating pellet boiler at the site providing warm air heating and hot water for the showroom). The Renewable Heat Incentive (RHI) scheme launched by the previous government and being rolled out by the Coalition will reward generators of renewable heat through a tariff system. So now is an excellent time to consider installing a wood pellet heating system in your home, office or business.

Websites: [www.harvestwoodfuels.co.uk](http://www.harvestwoodfuels.co.uk)  
[www.surreyhillswoodfuel.org.uk](http://www.surreyhillswoodfuel.org.uk)  
[thompsonspaven.com](http://thompsonspaven.com)

Email: [jameslittle@harvestwoodfuels.co.uk](mailto:jameslittle@harvestwoodfuels.co.uk)

### Transition Guildford steps up apple pressing

This year Transition Guildford will be present at four interesting events over a total of seven days (see our latest newsletter calendars). As publicised, the Food Groups of Transition Guildford and GEF have merged so that we can do more events like this. We would love to have more people join in from the Forum membership. So please get in touch as the Food Group is now a really dynamic group.

We use a 12-litre VIGO apple press made in Devon and owned by GEF member Roberto Vogel. After we approached VIGO, asking for literature on their presses and enquiring about sponsorship, they kindly agreed to let us have a second 12-litre press on long-term loan. Hence we have doubled our capacity and could do with more volunteers to help at the events this year. Do come and get stuck in. You could also get free entry tickets!

### A plethora of Peregrines

Hardly a week goes by without sightings of Peregrines over Guildford. They have frequented the cathedral for a long time, and have now bred in Guildford for the second year in succession. The falcon (female) in both years was ringed on Chichester cathedral in 2009.

She and her tiercel raised four eyesses this year. These were ringed in May and three are still seen around. The fourth was picked up in Kent with a broken wing only a few days after fledging. Young Peregrines normally stay close to the nest site for some time, so how it got near Brands Hatch a few days after leaving the nest is a mystery. It may have been carried on strong westerlies, although Peregrines are masters of the air, or maybe it was just too adventurous. It is now recovering in the safe keeping of a trusted falconer; sadly, it's unlikely that it will ever return to the wild.



**Guildford Environmental Forum aims to improve the environment in and around Guildford for wildlife and for people and to build a sustainable future.**

Join us in our work for the town and have this newsletter posted to your door four times a year. Forum membership costs only £10 per year or £15 for a couple, and new members are warmly welcomed.

Please contact Adrian Thompson on 01483 222687 or e-mail [adrianthompson46@talktalk.net](mailto:adrianthompson46@talktalk.net)



# CALENDAR

All the Forum's Group meetings are open to the public



## Thursday 22 September

Transition Guildford free public event.

### "What's Transition All About?"

An Open Space event to discuss how we can make our community stronger and happier as we deal with the impacts of peak oil and economic contraction while urgently reducing CO<sub>2</sub> emissions.

1900. Guildford Friends Meeting House.

## 28 September to 2 October

"Route to the Future Roadshow 2011", Loseley Park.

A look into the energy, transport and other solutions for a low-carbon, high-energy-cost future. This is a major event showcasing many low-carbon local, national and international groups and companies. Includes training, a conference, a schools day and lots beside. Organised by Bricks and Bread Sustainable Living Centre.

See [www.routetothefuture.com](http://www.routetothefuture.com)

## Saturday 1 and Sunday 2 October

TG/GEF Food Group. We will be **Apple Pressing at "Route to the Future"**, Loseley Park.

Bring your apples and a bottle and take home your juice.

[www.routetothefuture.com](http://www.routetothefuture.com)

## Saturday 8 and Sunday 9 October

TG/GEF Food Group. We will be **Apple Pressing at Surrey Hills Wood Fair 2011**. Birtley House, on the A281 just beyond Bramley. Bring your apples and a bottle and take home your juice. See [www.surreyhillswoodfair.co.uk](http://www.surreyhillswoodfair.co.uk)

## Monday 17 October

TG/GEF Food Group. Anita Burroughs, Orchard Project Officer at PTES (People's Trust for Endangered Species), will talk about the results of the **National Survey of Traditional Orchards 2009/11**. These old orchards provide important habitat for some rare species.

Transition Guildford contributed by surveying 50 orchards within a 3-mile radius of Guildford.

1900. Committee Room 1, GBC Millmead Offices.

## Thursday 20 to Sunday 23 October

TG/GEF Food Group. We will be **Apple Pressing at RHS Wisley's "Taste of Autumn Festival"**.

Get your apples identified. Bring them and a bottle and take home your juice. [www.rhs.org.uk/gardens](http://www.rhs.org.uk/gardens)

## Tuesday 22 November

TG/GEF Food Group. Dr Paul Clarke, Professor of Education, St Marys University, London; Director of Incredible Edible Ltd and School of Sustainability:

**"More than a Radish: Why Growing Food in our Communities Matters"**.

1900. Council Chamber, GBC Millmead Offices.

## Wednesday 30 November

GEF Biodiversity Group. Rob Hewer, Head Ranger with the National Trust for North Downs West:

**"The Management and Wildlife of Denbies Hillside"**.

1900. Committee Room 1, GBC Millmead Offices.

# GUILDFORD ENVIRONMENTAL FORUM

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## Vice Chair – Damien Short

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## Membership – Position vacant

(Adrian Thompson pro tem)

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Guildford Environmental Forum's newsletter is published in March, June, September and December.

Please send contributions for the next issue to Clare Windsor by Monday 14 November.

The views expressed in this newsletter are strictly those of its contributors and Guildford Environmental Forum.