

The Banburyshire Brolly – Show 188

The podcast presented by Jules Procter on 16th December 2008

Welcome to the Banburyshire Brolly, the podstation promoting and celebrating the music, heritage and characters of Banburyshire. My name is Jules Procter

This is the second of two show looking at the world we live in, or could live in, and concentrates on the technology available to us. For this show I'm limiting this to aspects of electricity generation and transport.

The opening track, Lift Off by [Tantrum](#), reminds me that we have already developed the technology to send man to the moon, using less onboard computer power than you now have in an MP3 player. So, from a technology point of view, we ought to be able to develop a sustainable lifestyle and combat global warming.

So where do we start. First of all some ground-rules. All to often groups only look at their own area of interest, so let's start by defining our aim, and what is acceptable to get there.

The aim is to develop a sustainable lifestyle for all peoples in the world, at a quality of life based on the average for the UK in 2008.

To give us some guidance on how to get there, lets consider 3 concepts.

Firstly, Tactical methods and technologies. These are things which help us achieve our primary goal, but which may not be around in the long term or may be seen as detrimental in the long term. Coal definitely falls into this group. It is an essential fuel to help us over the medium term for electricity generation, and for use as a feed stock for the petrochemical industry, when oil runs out.

Secondly, Strategic methods and technologies. These are long term goals, which will allow the sustainability of our eco-system. Geo-thermal energy is an obvious technology for this, with the ability to provide us with power for thousands of years.

Thirdly, the room 101 or /dev/null, if you are computer literate, concept. These are technologies which we must avoid using as they will jeopardise our aim. Ones, where after analysis, they don't fit into our framework. The first technology to go the /dev/null route is nuclear fission. We just can't afford it, there isn't sufficient uranium ore to last for any length of time, and the cost of storing nuclear waste is immense. We don't want to leave a legacy of dealing with storing this waste for tens of thousands of years. Nuclear fusion, well that's another story, and definitely goes into the strategic group. There is enough deuterium and tritium, in sea-water, to fuel nuclear fusion reactors for millions of years. The progress to achieve a commercial fusion reactor has been slow, but steady over the past decades, and this is one of the areas where big physics will be of huge benefit.

Why do I know these things? Well, as a student, over thirty years ago, I was lucky enough to be taught nuclear physics by one of the team who built the first magnox nuclear fission reactor, and while I have always worked with computer systems, for a variety of public and private concerns, I have also always been a technologist, keeping an eye on developments and sharing my opinions from time to time.

There has been a lot of talk about renewable energy sources, in the shape of wind, wave, water and solar, and so I'd like to cover these. The two criticisms of wind turbines are that they are unsightly and that the wind doesn't always blow. Well that's as may be, but winds farms will be a necessary part of life until the next generation of wind farms comes along, in the shape of kite-power. A wind farm based on kites at a height of 2000 to 3000 feet, where the wind is much more predictable, is calculated to produce as much electricity as a nuclear fission plant of the same land area. And I know which I prefer. So current wind turbines go into tactical and kites go into strategic.

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Wave power generators not only produce electricity, but reduce the effect of the waves on shorelines, reducing erosion, and so they are of strategic importance. Large hydro schemes have rightly had a bad press, and will need to be phased out, this includes the proposed Severn barrage which is a room 101. However, small to medium size hydro plants, are an essential part of water management, and have a minimal environmental impact, so go into the strategic group.

Solar is another major potential source of electricity, and technologies current in field trial in both Germany and Australia should hit the market in the next couple of years, bringing both greatly improved efficiency and increase in areas where they can be used. One of products will be glass which captures UV frequencies of light, allowing visible light through, enabling this type of solar panel to be used as window glass. Solar furnaces, already seen in sunnier countries are also set to help us out.

Despite some very bad press in the past, two other countries which are also working hard on green technologies are the USA and China. The smart money in Boston, from guys who originally made their fortune with IT products, is now being invested in green tech, and the Chinese recognised some time ago that they need to clean up their act.

So there will need to be a greater mix of large-scale, central electricity generation, maybe using DC power distribution to reduce power loss, to feed industry. Then, medium scale, local generation for communities, and household electricity generation, using boilers based on Stirling engines and solar power, as examples.

We can't solve our power supply issues by just cutting back, we need to be bolder and embrace new technologies to provide the power for our future. We need to put solutions in place such that remote communities in rural, or island locations aren't faced with the disadvantages they currently have. That's enough to mull over for now, and after some music, I'll talk about transport. Here is What Will Tomorrow Bring sung by [Barry Hunt](#).

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Barry Hunt was followed by [ColvinQuarmby](#) with South American Dream. Following the oil crisis in the 1970's Brazil developed a transport fuel supply system based on ethanol derived from sugar cane, the first modern bio-fuel. By the way, the original Diesel engine ran on palm oil, and it was only the pressure from the petroleum companies which forced the use of what is now known as diesel. In order to move forward, we will have to develop a transport system which allows individuals freedom of movement, but which includes mass transport systems.

The problems are many. What fuels to use, how to curb pollution, what cost are we willing to bear, and what about capacity and congestion. The much hyped hydrogen economy is some time off, so goes into the strategic group. Fuels cells have been around for quite some time now, I gave a talk about them ten years ago at an IT conference, but still haven't reached the stage where they can be considered for the mass market. Whereas bio-fuels are both an essential part of energy security, and flexibility, so go into tactical and strategic. By using coal we will be able to replace oil-derived products, but bio-fuels will assist in filling the gap.

I was interested to read recently about the rejuvenation of steam power, not in the shape of the much loved locomotive from a bygone age, but high-pressure steam engines, where the steam is generated locally and then stored in a high-pressure, well-insulated tank. This may be useful in trams and other similar transport solutions, but isn't suitable for general use, I don't think. The same applies to the pressurised air engine. With both of them being tactical. Electric powered vehicles have got a boost this year, from the news of vast improvements to the lead-acid battery, but I think it will be hybrid cars which will win out.

However, car manufacturers have been way too slow in developing the vehicles we need, and this is why they are in such a mess. Technologies to improve fuel efficiency dramatically have been around for quite some time, but they have mostly ignored them. The exception in traditionally powered vehicles has been the Smart car, which is not only reasonably fuel efficient, but is also short in length, making it ideal as a commuting vehicle. Just think, it is far better to be in a queue of 100 Smart cars, than one of 100 people carriers, as the space taken on the road is substantially less, meaning that if you want to turn off left or right, you are likely to reach the turning more quickly. But we still need our people carriers for the weekend, to ferry the family around and take the dogs for a walk in the countryside. So maybe car-leasing of a commuting vehicle is the answer, hire a car to get you into work, let someone else use it during the day, picking up maybe another vehicle for the trip home.

To reduce congestion, get lorries to use the roads out of peak commuting time and give them an incentive to use roads, like the under-utilised M6 toll. Moving more freight back to rail or barge isn't a strategic option, but could be a tactical one.

Then there is flying. The cost of air travel has to go up, to be in line with other forms of transport. Fuel for aircraft is going to be a problem, and bio-fuels aren't the answer, as the amount of land required would be excessive. Shortage of time has driven us to use ever faster means of travel, but we still don't get from A to B in noticeably less time. So how about returning to a more fuel-efficient, charming and slower way of air-travel, in the shape of dirigibles, lighter-than-air machines? Somewhat fanciful maybe, to travel by balloon, but quite practical, and comfortable. There's a lot to be done, if we are to move to a world where we manage our resources responsibly and sustainably, together with proving a good quality of life for all. But it is achievable with the right mix of technology, willingness for change and hard work.

To close the show, here are [Cave](#), with And We Couldn't Stop Smiling, a group of young men willing to work hard to put their stamp on the world to come.

See you next time