

**The text of an article looking at a forthcoming AECB paper  
– ‘Less is More – Energy Security after Oil’.  
A light hearted look at how applying its findings might  
influence local economic development in Herefordshire.**

**Andy Simmonds & David Olivier**

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[originally written for the Hereford Civic Society Newsletter – published in Herefordshire c.July 20<sup>th</sup> 2011]

**Andy Simmonds:** is an architectural designer and sustainable building consultant, having extensive experience with historic buildings and materials, refurbishment and new build. His practice Simmonds.Mills Architects designed the roundwood, rammed earth prototype building at Hooke Park in 1989. For many years Andy mixed design work with structural carpentry, rammed earth and various specialist construction skills used in low energy sustainable construction. More recently Simmonds.Mills have concentrated on architectural design and consultancy as the size of projects taken on has grown. As part time CEO of the AECB - the sustainable building association, he initiated and developed the AECB CarbonLite project, including the AECB/TSB low energy buildings database and the CarbonLite Silver/Passivhaus/Gold detail design guidance. Simmonds.Mills' non domestic 'BREEAM Excellent' building in Essex recently gained Passivhaus Certification and his family home in Hereford is an exemplar near-Passivhaus 'whole house' low energy refurbishment. Andy works closely with local energy specialist, David Olivier of Energy Advisory Associates, on architectural and AECB research projects.

Recently working with AECB Trustees, including local Trustee Nick Grant, and other Partners, he has helped set up the Passivhaus Trust, as the natural evolution of AECB CarbonLite. The Trust's members now include many large design and construction companies including locally, Simmonds.Mills, Architype & Kingspan.

Currently he is working with David Olivier on a report for the **AECB** entitled, “**Less is More – Energy Security after Oil**”. The conclusions and approach developed during preparation of the report is the basis for this article.

**David Olivier:** 30 years ago, the principal author of ‘Less is More’ was responsible for what was arguably the first detailed energy scenario building exercise which had the goal of decarbonising the UK economy. In the subsequent three decades, he has continued to work in energy, in the main helping to design individual building projects and writing reports for private clients. Over this period, he has been responsible for some of the UK's most energy-efficient buildings.

*“When it comes to the future, there are three kinds of people: those who let it happen, those who make it happen, and those who wonder what happened.”*

John M. Richardson, Jr.

This article is an attempt to illustrate the possibilities for the County’s economic and infrastructure development in the context of declining fossil fuel and other natural resources, environmental degradation and predicted growing climate instability. In the article I suggest that if we were to take an imaginative and *integrated* approach to our county’s future development - informed by scientific principles and examples of successful developments elsewhere – our older selves (our children and grandchildren) would not be wondering what had hit us so hard when looking back at the County from 2050.

### **Looking Forward to 2050 - Our Changing Economic Fortunes**

*“My concern, like millions of others, is that for the first time for more than a century, the next generation will struggle to do better than the last.”*

Ed Miliband, Leader of the Labour Party<sup>1</sup>

I also share this concern.

In the USA. ex. financier and Post Carbon Institute Board member, Nate Hagens emphasises how fossil fuels have turned us into ‘super humans’:

*“The amount of human labor that oil and other fossil fuels have been able to replace or allocate to other pursuits is gargantuan. The average human can generate only about 0.6 kilowatt-hours per day from physical effort... [that’s] more than \$300 per kWh... Oil, even at \$110 per barrel, costs us just 6 cents per kWh, or 500 times cheaper than human labor.”*

He illustrates how replacing human effort with fossil fuels has been the primary driver of economic riches of the past couple of generations, adding:

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<sup>1</sup> **Monday 23rd May** Two big speeches were given by important politicians in the UK. Both the Leader of the opposition, Ed Miliband, and the Deputy Prime Minister, Nick Clegg, spoke about the need to work for future generations and the responsibilities that one generation has to the next.

*“For all intents and purposes, on human time scales, oil in our lives is indistinguishable from magic.”<sup>2</sup>*

## **Impact of an unstable climate on our grandchildren**

Meanwhile the work of many scientists, including Dr. James Hansen of the NASA Goddard Institute for Space Studies - Earth Sciences Division demonstrates the clear link between fossil fuel use, stability of our global climate and the likely impacts on our children and our grandchildren if we pursue ‘business as usual’:

*“...fossil fuel emissions must be [rapidly] phased down to restore Earth's energy balance and stabilize global climate...*

...

*Governments must act immediately to significantly reduce fossil fuel emissions to protect our children's future and avoid loss of crucial ecosystem services, or else be complicit in this loss and its consequences.”<sup>3</sup>*

He states that despite overwhelming evidence, governments and the fossil fuel industry continue to propose that all fossil fuels must be exploited before the world turns predominantly to clean energies. Yet he argues that a scenario that stabilises climate and preserves nature is both technically possible and essential for the future of humanity.

Recent newspaper articles on reduced solar activity giving us a ‘get out of jail card free’ on global warming appear ill informed: if the decrease in energy from the sun predicted for a few decades to come does occur, we may get a cooling of around 0.3 degrees K, compared to a predicted rise in temperatures under the ‘business as usual’ scenario of 2 – 4.5 degrees K by 2100. It won’t stop the acidification of the seas from increasing CO<sub>2</sub> in the atmosphere either. As suggested in a New Scientist editorial in June, “That isn’t a new ice age: it’s a slightly less severe heatwave’.

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<sup>2</sup> [<http://www.creditcrunch.co.uk/forum/topic/9590-energy-the-elixir-of-the-economy/>]

Nate is a well-known authority on global resource depletion. Until recently he was lead editor of [The Oil Drum](#), one of the most popular and highly-respected websites for analysis and discussion of global energy supplies and the future implications of energy decline. He holds a Masters Degree in Finance from the University of Chicago and is currently completing his PhD in Natural Resources at the University of Vermont. Previously Nate was President of Sanctuary Asset Management and a Vice President at the investment firms Salomon Brothers and Lehman Brothers. He sits on the Board of the Post Carbon Institute.

<sup>3</sup> May 5, 2011: [The Case for Young People and Nature: A Path to a Healthy, Natural, Prosperous Future](#): Science basis describing what is required for governments to fulfill their obligations to young people and future generations.

[<http://www.columbia.edu/~jeh1/>]

So before looking at what ‘Less is More – Energy after Oil’ has to say, let’s have a look at why indeed ‘it’ may indeed be ‘all about energy’ .....

## **Energy and Economic Development**

The UK has not had a coherent Energy Policy since WWII. Yet such a policy is vital – it could create the basis for UK economic prosperity and citizens’ wellbeing or it could set in motion an overall decline in the fortunes of the UK.

Past Government lack of success in this area combined with the precarious situation we find ourselves in, economically and environmentally, means we really do need to get it ‘right’. The consequences of a less than successful policy would appear to be severe - for all of us.

**“The world has never faced a problem like this.”**

Hirsch report, US Department of Energy, 2005

The Hirsch report concludes that; world oil peaking is going to happen, probably within a decade; previous energy transitions (wood to coal and coal to oil and gas) were gradual and evolutionary - oil peaking will be abrupt and revolutionary; there will be no quick fixes, but early mitigation will avoid significant economic hardship and major upheaval. It appears that previous (and current UK government) were aware of this, whilst publicly soothing us, that ‘all will be well’ ...).

It is worth remembering that economic activity has historically followed patterns of energy availability, wood, coal, wind(mills), water(wheels), geothermal (spa’s) and so on. With the discovery of fossil fuels, the localised industries became delinked from local energy sources and fuels. Thus Herefordshire’s activities, like the rest of the country, are no longer based on local forms of energy. For the bulk of the County’s citizens and businesses this situation cannot be easily or quickly reversed, given our current levels of population and the living standards we have become accustomed to

## No Silver Bullets

Silver bullet - Biomass, Carbon Capture and Storage, Nuclear?

Previous groundbreaking reports in this area, such as The Centre for Alternative Technology 'Zero Carbon Britain' have arguably placed too much emphasis on the potential for biomass (wood and other plant material) for replacing our needs for heat and power.

Affordable access to wood fuel, even for rural Herefordians, will be limited by rising costs and falling availability. Increasing wood burning will lead to severe impacts on air quality, which explains why DEFRA and DECC have different takes on the Renewable Heat Incentive, with DECC promoting biomass as 'low carbon' fuel, and DEFRA warning of significant additional health costs for the community, including 540,000 premature deaths/year across Europe. The recent AECB paper, 'Biomass – A Burning Issue' even challenges the idea that burning biomass is 'carbon neutral'.

Whilst oil and gas won't disappear that quickly (relative to 4 year terms of office) prices will probably rise. The social, political and environmental impacts of extracting gas and oil will increase. Endless conflict, and political corruption from nations chasing increasingly hard to extract, diminishing supplies of fossil fuels (or uranium) is not an attractive background for our children to grow up with – or fight for.

Carbon capture and storage - watch this expensive space, or don't burn the coal in the first place?

We must remember that Energy is not the same as Electricity – confusing the terms means confusing the debate. Electricity demand is increasing and government plans to further increase the use of electricity – electric cars, electric heat pumps and so on, underpinned by a combination of many new nuclear power stations and on and offshore wind power. Meanwhile Germany plans to *reduce* the use of electricity.

Nuclear power has never provided more than 4% of UK total *energy as delivered to consumers* yet has cost £ billions in public subsidies - and we still don't know how to store the waste, whilst building reactors in risky low lying areas exposed to storm surges. We need to be open to the debate, but arguments for needing a large expansion of nuclear power stations are not yet made, rather they are driven by an Energy policy that has a vision of an 'all electric Britain' – not accepted in other countries -

and by powerful commercial interests. In current debates the missing piece of the jigsaw is energy efficiency. In my view the underutilised energy efficiency technologies appear to offer more in terms of economic prosperity (including that being more fairly distributed) and benefits to communities and citizens, than big shiny power stations and expensive energy in the form of electricity.

So, if we have no silver bullets and we want to maintain warm homes and continue to use modern appliances and equipment without destabilising the climate and going bankrupt, what's our 40 year plan to achieve a safe, viable, prospering County in 2050?

### **Democracy & Short Termism**

**“There is a Greek proverb I wish every elected [federal and state] official would recite before starting any talks about our energy policies and challenges: “A society grows great when old men plant trees whose shade they know they shall never sit in.”**

LZ Granderson<sup>4</sup>

Simply put, short term thinking can be a serious problem - it always has been, but perhaps never more so than now.

*“Tackling climate change, like boosting social mobility, is a long-term challenge. So one of the biggest questions facing politicians today is: how do we get better at tackling long-term problems, rather than taking the easy route and leaving them to future governments?”*

Nick Clegg<sup>5</sup>

*“Are our structures of economic decision-making fit for purpose? That depends on what the purpose is, of course. If decisions need to be made for the long-term, and if they should take into account a balance of different interests and concerns, which they should, then the answer has surely got to be no. 'Good transition' to a green economy will require changes to the current short-term nature of the political system’*

*Victor Anderson, One Planet Economy Leader, WWF<sup>6</sup>*

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<sup>4</sup> Article by LZ Granderson on America's short-sighted energy policy, and how Democrats are playing up to Republican spin rather than fighting it. ([America, get real about the high cost of cheap gas - CNN.com](#))

<sup>5</sup> [Monday 23rd May (earlier this week) two big speeches were given by important politicians in the UK. Both the Leader of the opposition, Ed Miliband, and the Deputy Prime Minister, Nick Clegg, spoke about the need to work for future generations and the responsibilities that one generation has to the next.]

Both nationally and importantly locally we need to start thinking about our old age, our children and grandchildren much more realistically. We need to look at improving the quality of our understanding about the challenges we face and the quality of our decision making. We need to improve the quality of our local democratic processes, whilst ensuring that *“defending the interests of young and future generations does not become party political, but continues to be pushed up the agenda of all politicians, no matter what party they are from or what their ‘colours’ are.”*

Think 2050 blog - An advocacy platform for young and future generations

I believe that we could start to make solid plans for mitigating and adapting to climate change, right here in Herefordshire - aiming to demonstrate an *affordable* and more equitable energy transition. But how do we plan this transition locally, if the national government’s plan perhaps does not seem credible, proves to be unaffordable, or doesn’t fit the nature of Herefordshire? What if Herefordshire had the audacity to ‘lead the way’?!

Clarity and inspiration could come from “**Less is More - Energy Security after Oil**” originally intended for the national energy and building industry I became hopeful that it might strike a chord locally, with business *and* sustainability groups in the County. “**Less is More - Energy Security after Oil**” illustrates why the UK should implement energy efficiency and waste heat utilisation, on a scale not seen before, before investing in expensive forms of low carbon energy supply. The report challenges the expensive, even impracticable energy future which we seem to be headed for.

We asked amongst others, **Professors Robert Lowe and Tadj Oreszczyn from University College London** to review ‘Less is More’:

“30 years ago, the author of this report [**David Olivier**] was responsible for what was arguably the first detailed energy scenario building exercise which had the goal of decarbonising the UK economy. In the subsequent three decades, he has continued to work in energy, in the main helping to design individual building projects and writing reports for private clients. Over this period, he has been responsible for some of the UK's most energy-efficient buildings.

...

The report does not offer the prospect of an easy path to energy independence and decarbonisation. It makes it clear that all options pose acute difficulties. But it warns policy-makers not to reject technologies because they appear difficult without making sober comparisons with other technologies under consideration.”

## **Here are the main conclusions of ‘Less is More – Energy Security after Oil’:**

### **Peaks and pollution**

The UK has passed its own “peak coal”, peak oil and peak gas and has set itself a legal requirement to reduce emissions of greenhouses gases (GHGs) by 80% by 2050. However, stronger action than this now appears necessary. A body of scientific opinion suggests that we need to return atmospheric CO<sub>2</sub> concentrations to 350 ppm from today’s level of 390 ppm.

### **Economics**

Although we must respond to climate change, and are increasingly concerned over fossil fuel shortages, it is economics which dictates that our energy future will be very different from the past. Most future energy supply systems are much costlier than the fossil fuel systems which have fuelled the development of industrial society. Energy efficiency technologies may compete with/undercut past or present fossil fuel supply, but little else does.

### **Confidence of success**

The conclusions are in line with what has empirically worked in other countries and regions, especially parts of mainland Europe and North America. The report emphasises the importance of basing our energy future on proven technologies - not on technical breakthroughs which would be useful but which may never happen.

The report questions that current climate change programs can deliver a sustainable and affordable energy system. We need a fresh start, via a policy which gives energy efficiency in all its aspects a central role. The UK would then stand a better chance of improving current levels of prosperity, health and well-being as fossil fuels run down. It is better to be realistic now about the difficulties of securing sufficient energy supplies after oil than to continue with policies whose outcome could be unsuccessful.

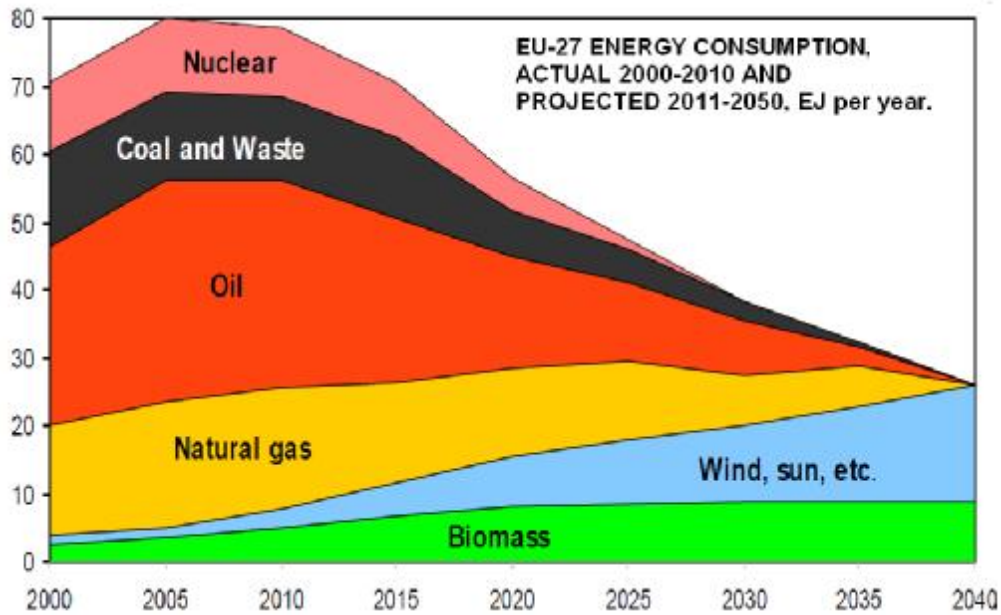
### **Morals, Leadership and Business**

The UK was the first country to industrialise. It has contributed disproportionately to past worldwide CO<sub>2</sub> emissions. So it is especially fitting to suggest that it takes a practical lead in trying to solve the problem. With the economic benefits of energy efficiency, it appears that it would be practicable to do this at little or no cost versus continuing with the current energy system. There would be a saving versus the current policy of shifting from fossil fuels to renewable and nuclear electricity.

Aiming for faster greenhouse gas (GHG) reductions, and achieving them in a more affordable and equitable way, would strengthen the UK economy in the medium to long term and improve social cohesion. It offers to position the UK, the first industrialised nation, as a leader and role model for other countries, in the efforts to establish energy security for a world after oil in particular and fossil fuels generally.

I suggest that “Less is More”, having taken the most widely informed and integrated approach offers intriguing possibilities for those living and working in Herefordshire over the next 40 years - so let’s have some fun and illustrate what it might look like in our County!

The illustration below illustrates a possible vision of a 100% Renewable Energy Supply in 2040 for the EU-27<sup>7</sup>



<sup>7</sup> Source: International Network for Sustainable Energy, Gl. Kirkevej 82, DK-8530 Hjortshøj, Denmark. [www.inforse.org](http://www.inforse.org).

## **Less is More – *looking forward to 2050***

### **Herefordshire In the Papers**

#### 2011 – 2015

Unrelenting media coverage of events in oil and gas producing nations, global and national financial convulsions and the growing political restlessness of people young and old in the UK provides a vivid backdrop to Herefordians' thoughts, as local politicians of all parties and their electorates increasingly appreciate the harsh realities of the Government's policies.

The UK economic situation becomes increasingly difficult, and social and economic inequalities across Herefordshire become more pronounced. Younger people start to realise that engaging with local politics may be the only way to safeguard their future wellbeing.

No major infrastructure projects are started, but exciting plans are discussed to build a new bridge over the Wye - sadly there is no funding available.

However following well evidenced proposals from a number of councillors, trials of hitherto unimplemented measures to reduce traffic congestion are a surprising success and a campaign to maintain rural bus services combined with innovative community transport schemes is lauded nationally as an exemplar approach to sustainable and affordable transport.

A brief respite for the troubled health service is provided when widely supported 'pay your tax' campaigns encourage the Government to agree fairer tax contributions from multinational business. Combined with the renegotiation of PFI hospital contracts, to the benefit of the County, significant money is released to urgently improve Health and Social Services.

The business opportunities for the local construction sector, based around low-energy, low-carbon refurbishment becomes apparent. Energy bills soar and colder winters, caused by changes to North Atlantic wind patterns appear to be here to stay. The Government announces that the energy utilities will be regulated and incentivised to invest in the cheapest

measures, whether energy reduction or supply. Herefordshire businesses, having had the foresight to invest in the skills and accreditation required, are well positioned to compete with the Utility owned Green Deal companies. The market for the Green Deal finally starts to take off, and local campaigns to 'Keep it in the County' encourages householders to use local Green Deal firms – successfully enriching Herefordshire's economy, rather than the profits of the multinational energy companies.

### **2015 - 2030**

For the 2015 Local Elections Herefordshire's most forward looking political groups combine and gain a majority in the County Council. They immediately start to implement their long planned joint 'Business Green' and 'Transition Skills' programme. The Council form an influential national group with several UK and Continental Local Authorities with similar programmes, including green thinking provincial administrators in China. Sharing experience and expertise the Council develop several innovative financial investment models and trade arrangements based on a wide range of energy efficiency technologies and products, related skills and knowledge exchange.

Several completed projects for water turbines combining energy production with flood control, habitat creation and tourist features – are recognised as a model for sensitive water power developments across the UK.

. The Council limits the number of wind turbines in the county but contentiously approves a maximum of five large community owned turbines. This creates friction between local communities and powerful individuals, despite connections to the national grid being laid below ground. However as the UK starts to suffer electricity shortages against a backdrop of a struggling nuclear programme beset with cost overruns, technical problems, and protests at the nearby Oldbury, Glos. and Hinkley, Somerset nuclear sites – attitudes start to change.

Bids for ambitious low carbon district heating schemes for Hereford City, Ledbury, Leominster, Kington, Weobley, Bromyard and Ross on Wye are submitted to Europe by the Council. These bids are successful and the match funding for the laying of hot water pipes in town centres is offset by a charge on privatised utilities, telecoms and entertainment companies laying cables at the same time. The work programmes of water, gas and power utilities is also integrated with the project and the system is

installed on budget, on time - with the added benefit that gas and sewerage maintenance has been achieved earlier and more cost effectively. In a popular move fibre optic broadband cables are also laid to share the cost of digging and bring internet access into the 21<sup>st</sup> C.

Herefordshire's accelerated Green Deal programme has increased householder's comfort levels during the colder winters –caused by North Atlantic weather changes - and hotter summers. The county's skilled Green Deal SME's and related start up manufacturing companies increasingly provide their services to neighbouring counties.

An increasing number of city and town centre flats, houses and businesses have been insulated and are now serviced by low cost hot water district heating – powered by a network of neighbourhood scale Combined Heat and Power units running on a natural gas and Biogas fuel mix. Some towns have invested in installing field scale solar thermal panels to contribute to the heat network.

### **2030 - 2050:**

As winter power cuts continue across the UK, Herefordshire towns demonstrate their resilience . The networks of heat and power units providing hot water, also produce electricity when the national grid goes off. Increasing numbers of off -gas grid rural homes have been insulated to near Passivhaus levels and stay warm affordably through the cold winters.

The Hereford Times reports that the County is one of the happiest and most stable places to live and work. Top stories in 2049 recount the political developments that led to broader representation, fresh ideas and improved decision making.

In 2050 the UK's Devolved Administrations Group Leader presents Herefordshire Council with the UK's most prestigious award for the County's inspirational, democratic, evidence and science based forward planning – and for having the audacity to demonstrate a better way forward.