Hope & Glory?

Green Ventures UK

the next ten years for carbon-positive entrepreneurs

by John Grant and Jules Peck
thecarbonpositivecompany

18 December 2007

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acknowledgments

We would like to give our thanks to people who very kindly read and gave comments on a draft of this paper including: Maggie Brenneke, Kavita Prakash-Mani, Seb Beloe, John Elkington, David Bent, Peter Madden, Lila Preston, David Blood, Zac Goldsmith, Jeremy Leggett, Mark Kenber, Pooran Desai, Hugo Spowers, Adam Bruce, Lucy Johnson, Charlie Thomas, Nick Robbins, Paul Dickinson, Ben Goldsmith, Rob Wylie, Charlie O'Malley, Ciaran Mundy, Jonny Wates, Amory Lovins, Laura Howard, Judith Clegg, Matt Christensen, Mark Campanale, Jamie Mitchell, Nicolai Peitersen, Cyndi Rhoades, Joel Makower, Ed Spiegel, Andy Hobsbawn, Matthew Taylor, Luke Nicholson, Dr Kenny Tang, Graham Reed, Tyler Moorehead.

some comments on the paper

"The mark of a rooted futurologist, in my book, is the ability to see peak oil as a clear and present danger, amid institutionalised denial in government and the energy sector, and pretty uniform ignorance beyond. This issue is going to dominate all our lives, and the tsunami can be expected within the next five years. The more out-of-box thinking, and proactive acting, we can do, the better, and Jules and John do a great job at that."

Jeremy Leggett – Chairman, Solar Century and CEO, Solar Aid

"I love your thinking. Remember Climate Change is like the internet. It arrives one day, it gets bigger every year, it never goes away so you have to learn to make money out of it or you will get eaten for lunch"

Paul Dickinson – CEO, Carbon Disclosure Project

"I agree entirely with your analysis that moving beyond cleantech will be a crucial response to the somewhat scary but realistic vision you paint. Ultimately this is about opportunity to innovate and create the kind of low-carbon world in which society and business can flourish"

Mark Kenber – Policy Director, The Climate Group

"I guess the challenges for the UK in this next investment boom will be the same as we have always had in high tech: we still don't have a great cadre of serial entrepreneurs, entrepreneurial managers, VCs and skilled angel investors to give high quality start-ups the edge they need to succeed. Don't get me wrong, we are in a better position than most of our European friends. But the Silicon Valley model you talk of is still, sadly, years away for us - we were simply much later coming to the game of venture capital and high growth start ups compared with the US."

Jamie Mitchell – MD, innocent drinks

"Most major technologies – PCs, cell phones, software, the Internet, solar energy, etc. – have come from smaller, entrepreneurial players, which are then gobbled up by bigger fish that have the ability to achieve economies of scale and commercialize them to the masses. (Understanding) how this has happened in the past, it makes it much more credible looking forward."

Joel Makower – Co-founder, Clean Edge

objective of this paper

In this paper the authors attempt to survey what the role of high growth entrepreneurial businesses and VC investment may be, to meet the challenge of building a low carbon economy in the next ten years. The cleantech boom is well known and we see a continuation of this in years to come. But there are many other less obvious sectors and business models.

Our objective it is to stimulate interest in the full range of such opportunities, and with it to contribute to a Silicon Valley style dialogue and cluster where VCs and green entrepreneurs meet.

The paper is already the result of a consultation with over forty leading experts in this field, and is being debated on the 10 December 2007 with a select gathering of major and specialist VCs and eco-entrepreneurs and available online at **www.theglasshouse.net**

This paper focuses primarily on the environmental dimensions of sustainability rather than social aspects which involve other issues and perhaps require a different approach – the subject of a future paper perhaps. We have focused on the role of high growth entrepreneurial ventures. There will be a strong role played too by corporate, governmental and small business. But we see new ventures as having the potential to go further and faster, offering more radical solutions and alternatives.

intro

"There is a tide in the affairs of men
Which, taken at the flood, leads on to fortune;
On such a full sea are we now afloat,
And we must take the current when it serves,
Or lose our ventures."

Shakespeare sums up well the scale and urgency of change we envisage but also the opportunities for those nimble and innovative enough to spot and ride this great wave. In this report the authors examine the critical role of entrepreneurial ventures as one of the key sources of the radical-enough responses required to deal with issues like Climate Change. The term carbon-positive is used as carbon is a good proxy for all sorts of other issues and 'positive' because 'carbon-neutrality', especially merely through offsetting, is surely not going to be sufficient. Ambitious companies of the future will need to seek to be restorative and to bring something positive to the table not just seek to be at best neutral players.

Although carbon is a good proxy it is far from the only issue facing us - species and habitat loss, water scarcity etc are all real concerns. A fixation on carbon which ignores these other concerns will be a pyrrhic victory. A zero carbon renewable energy world which merely encourages more and more electric batteries will soon lead to 'peak lithium'. We need to learn to recognize absolute limits to growth – but that's a big political and economic debate and not one we look at here. Some of the solutions are complex and bring with them trade-offs (reducing 'food miles' versus cash crops for Kenyans) which will need to be worked out in debate between consumers, government and business.

Governments and corporates, for all that they are now increasingly making the right noises, are still moving at lumbering pace, if at all. The 'innovators dilemma' applies; incumbents will never properly commercialise technologies that fundamentally undermine their industry. There are huge gaps already in what is needed to become a low carbon economy. Ultimately will this crisis and these shifts represent boom or bust, hope or glory, danger or opportunity - or both?

There are inspiring examples of pioneering green ventures but they are often under-funded, under-supported by regulators, under-recognised. In the next ten years we need expansion at least as big as the dotcom boom. It's already starting to happen notably in the US and China. Google has just announced millions of dollars investments into renewables with the intention of pushing coal out of the market and Shi Zhengrong, who in 2001 created the company Suntech, making solar cells, is now China's second wealthiest man. London has become a centre for European efforts in cleantech and beyond. But is it enough? What's missing? What's next?

context

To grasp what the challenge is over the next ten years – where the significant gaps are that only new ventures may be able to fill – we need to take a very broad view of the long-term environmental challenges and potentials for development to tackle them. For that reason we look in the 'challenges' section of this report at issues such as climate change, peak oil, inequality, ecosystem meltdown, population and recession.

Such issues have been covered in much more detail elsewhere, in the Stern report and numerous authoritative surveys. But we felt it was necessary to at least capture the scale of the global challenge and the diversity of potential approaches, to set the scene for a grounded analysis of where the key sectors of opportunity lie in the short term, and in the limited context of UK businesses.

We are entering a period of huge transition

The starting point is recognizing that we are entering a period of rapid and radical change. In this period some companies, both existing and new, will jump the right way and others the wrong way. If enough of the economy jumps the right way then the pain for society will be less. One of two things will deliver this huge change:

- Either - as a society we realise the urgency and scale of change needed and our political, financial and corporate systems will respond by putting in place the regulatory, fiscal and communication/behaviour-change shifts needed. These shifts will have to deliver the radical infrastructure changes needed to ease transition to a zero carbon economy. Within such change lie huge business opportunities for the clever and innovative. The earlier such responses happen the smoother the transition and easier it will be for all. Progressive companies will need to lobby governments and educate consumers to demand these changes.

- Or, we do not respond or do so too late and a combination of the shocks we detail below could cause economic collapse and global societal meltdown from which it will be much harder to recover.

This has huge implications for investors and new business models will win

The choice of which of these two worlds we have is ours and a key catalyst to gaining the first will be business innovators and their investors. The principle question of 'what will be the high growth industries of the future most open to new ventures?' has to be put in context with what that future is going to have to look like. Once one accepts that radically different future the real question will be seen to be not only 'what will be profitable', high growth and so on, but rather 'what businesses will survive and prosper under such radical change?'

"It's a paradigm shift and in a paradigm shift the earlier movers win, and the earlier movers stand to win big. There are new technologies yet to be invented, new fortunes to be made."

Ray Andersen – CEO, Interface

There are big opportunities for challengers in this chaotic period of transition. We see this as potentially at least as disruptive as the digital revolution of the last fifteen years.

But there is also massive public and media scepticism about corporate motives and the extent to which companies are genuinely behind tackling the problems rather than merely making capital while paying lip service. It is almost impossible from a large corporate starting point to avoid accusations of green-washing; they've got rid of plastic bags but what about their treatment of farmers, their food miles and so on? We believe many of the new companies will exhibit a degree of idealism, being 'not just for profit'. There are numerous examples of this sort of company already with proven appeal beyond niche 'ethical' markets, for instance Green & Blacks or innocent. It's not a question of brand affinity, or 'cool', it's a question of trust. That style of company make up doesn't always sit comfortably with venture capital – but it is vital for the success of the next wave that the two come to a mutual understanding.

Some may say that this paper is polemical in places and paints too stark a vision of the environmental challenges ahead. We'd counter that we did not wanted to pull our punches and are attempting to tell the truth as seen by its authors who are concerned at the widespread self-censoring of the real story by the green movement. These are the same facts which have recently fed into the Conservative Party policy development process and have been the basis of numerous discussions with leading companies.

The general view which is our starting point is that even under an optimistic scenario of positive change, just in the nick of time, pressures will harden. S*hould* will become *must*, through a combination of regulation, crisis management, rationing, taxation… but also public will. Evidence from the history of other such crunches suggests that culture accommodates and comes to support change through a swing in what is (and is not) socially acceptable. The rampant, aspirational, ostentatious, arguably obnoxious consumerism of recent decades could well be replaced with a sort of neo-puritanism, where living simply, within the planet's means is a key value. We cannot survey the future by assuming that the status quo will continue. Once you assume radical change, and even unthinkable changes from a present point of view, you are much freer to see opportunities, as well as potential catastrophic risks and pitfalls. Being free to re-imagine life as we know is of course the entrepreneur's key skill:

"Systems have been created to satiate our need for understanding, operating and organising our lives accordingly - like governments, banking, food systems, transport systems, economic models, etc. But the systems which have been created to date are faulty and fail us for the most part. While huge swathes of society have seen improved standards in living, the majority of the planet lives in poverty and the planet itself is dying because there are too many of us operating in badly managed man made systems. (But we know all this). I'm a firm believer of imagining what that perfect world would look like and then working backwards to try and figure out how to get there. If the vision is a carbon positive society as outlined in your paper, then it's a language which needs to be understood and agreed upon globally. But this will take time. Human beings are incredibly diverse. Getting everyone on board will be the tricky thing, with so many diverse realities about what the problems/solutions are, it will be difficult to imagine one vision. Diverse and creative visions are sprouting as you mentioned in response to environmental crises and social constraints."

Cyndi Rhoades – Founder, Anti-Apathy/Worn Again

This is the kind of distant future you have to start to imagine if you want to map the more immediate opportunities of a sustainable economy. It's not for the faint hearted, nor for those lacking some personal conviction or commitment to tackling the problem. But it will likely be the engine of revolutionary change, and despite the risks (entrepreneurs and VCs thrive on the sorts of risks which corporates shy away from), aggressive funding and ambitious new ventures will almost certainly play a key role.

challenges
– what tectonic plate shifts will define the shape of the 2007-2050 landscape and beyond?

Expect a perfect storm of issues driven by rising awareness of things like climate change. While the issues we cover here are long term, the 'Niagara Effect' (of being aware of a large drop ahead and taking desperate action now) could act much sooner. In terms of energy production we happen to be at a point where the world is due to upgrade old plant and build huge arrays of new power plant in the very near future. This therefore represents a huge opportunity to build this energy generation in a way which is fairer both to people and planet.

There is also a rational scientific argument for making haste now, on top of the 'the longer we leave it the more it will cost' economic argument put forward by Nicholas Stern. Business Commissioner for the UK Sustainable Development Council, Stewart Davis describes this as similar to the process of turning a large ocean going vessel. The degree to which we turn the corner in the next 6 years, according to IPCC data will disproportionately affect the longer term outcome.

Davis argues that we should actually drop all the talk of 'by 2050' and focus on 'by 2012'. He also points out that despite the Kyoto treaty being ten years old, current data consistently tracks the 'business as usual' line; there is a lot of talk (it is tempting to say 'hot air'), but no improvement.

Climate change

- The key words are **scale** and **urgency.** We have a huge transition needed and we need it fast:
    - Global emissions need to peak 2015-2020 and then start declining – and that whilst we bring billions out of poverty
    - Most talk of the need to put in place the foundations of a zero-carbon economy in the next 8-15 yrs so that we are not locked in to high-carbon infrastructure Gaining climate security means also spending additional money now on 'climate insurance' in radical change
    - The CBI now say 'the next 3 years'
    - The International Energy Agency projects that to meet the world's rapidly growing need for energy we need to invest $21 trillion between now and 2030. Clearly it is crucial that is all as low carbon as possible.
    - Stern's report told us that if we start the radical shift to zero carbon now in 2007 costs could be 1% of GDP but if we delay they could be 5% or higher[1]

[1] These costs are likely to be conservative as they were based on a 550ppm stabilisation target

- At 1% that would mean a costs of $617bn globally to mitigate and adapt of which the UK has historical responsibility for 4.3% which is £12.5bn annually[2]

- We are perilously close to locking ourselves in to a 2 degrees+ temperature change beyond which we release naturally stored carbon and methane (for instance from melting permafrost) and unstoppable feedback-loop meltdown occurs. In fact the very latest from Hanson at NASA suggests we need to stick at a 1.7 degree level.

- Many had been assuming the developed economies needed 90% reductions in emissions by 2050 to reach a 60% global result but IPCC's 4th report has suggested we may need 85% global reductions in emissions by 2050. What kind of levels of emissions reductions does *that* indicate for the UK by 2050? - 100%?

- Research released in December 2007 by New College Oxford shows that – far from having fallen as Government suggests – UK emissions have actually increased by 19% since 1990 when one takes into account embodied carbon in our imports and international aviation and shipping accountable to the UK

- IPCC is the world's largest consensus process so is necessarily cautious and slow to respond to new science – how much worse might the truth be?

- It is estimated the UK needs to be cutting emissions by 8%/yr at least, by 2012. Assuming 3% economic growth that means 11%/yr. Currently we are struggling to reach 1%/yr and 2012 is only 5 years away….

- Recent evidence shows 80-100% emissions cuts are possible for UK:

    - 100% by 2027 possible - 2007 CAT report (endorsed by Sir John Houghton Co-Chair IPCC)

    - 80% by 2050 possible – IPPR 2007 report

    - 60% by 2050 possible and costing only £100 per household or 1% of GDP – McKinsey and CBI report 2007 [3]

Peak oil and gas[4]

- Many estimate that peak oil will hit in the next 10yrs, some that we are almost there already

- Sudden realisation could lead to meltdown in our financial systems

- To adjust in time we need to shift fast to non fossil fuels

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[2] http://www.christianaid.org.uk/stoppoverty/climatechange/Truly%20Inconvenient.pdf

[3] In the view of the authors 60% is far too low a target for the UK

[4] For more on Peak Oil see http://www.youtube.com/watch?v=fFaNMmpbuIg

- This represents a fundamental energy crisis to which there is only one solution - a low carbon economy

Ecosystem 'meltdown'[5]

- 10% - 30% of all mammal, bird and amphibian species are threatened with extinction.
- 20% of the world's coral reefs have been lost in the last 20 years.
- 30% of the world's mangroves were lost between 1990 and 2000. Mangroves are the nurseries to our fish stocks - on which many people rely for protein
- 50% of the planet's forest cover has been destroyed, most during the last 30 years.
- All the evidence shows us that we are fast losing fresh water stocks
- Climate change threatens to escalate this damage exponentially if not halted

Population

- Food is key - by 2050 we need 50% increases in food production which means 50% increases in water for agriculture. But even now we are struggling for water for agriculture - add to this the effects of Climate Change and we are in trouble
- Agricultural productivity is predicted to decline by at least 20% over the next 70 years in tropical areas of Latin America, across Africa by 30% downturn, and in India itself as much as 40%
- Currently we have enough food surplus to feed 1bn more people than our 6.6bn and yet 850m are still malnourished - we can't get distribution and equity right even to help people survive let alone to prosper
- Overlay another 3 billion people AND Climate Change and we have a problem
- The 1billion gigatonne biofuel 'wedge' put forward as one part of the gap-filler for moving out of fossil fuels represents the land to feed 1billion people. Biofuels are an attempted response to Climate Change but if cars and their rich owners compete for land with the starving who is most likely to win?

Inequality

- Today's net worth of the world's 358 richest people is equal to the combined income of the poorest 45% of the world's population (2.3 billion people)
- In the UK people who earn at least 4 times as much as the lowest earners, produce 3.6 times the

[5] For more see http://www.panda.org/news_facts/publications/living_planet_report/index.cfm

amount of annual emissions.

- The 6 to 1 ration of wealth distribution in 1900 is now 75 to 1

- Climate change will hit the poorest parts of the world and the poorest people (often women) hardest, fastest

- If everyone in the world was brought to the level of at least $3/day and we kept the wealth distribution the same as it is now and the growth-resource intensity the same as it is now - we would need fifteen planets

Recession

- Seems to be heading our way already, many say there's a 50-50 chance. The credit crunch, the potential housing market crash, the already high ($100) price of oil; how much more can the economy take?

- Tightening of belts will mean people look to efficiencies and 'less is more'; as in the 1970s oil crisis it could spur many changes in damaging behaviour in the richest parts of the world; smaller/fewer cars, fewer flights, less luxury spending and consumer credit fuelled consumption, longer replacement cycle on appliances.

- But an early recession might hit sustainability efforts and commitments hard, before they have time to prove their economic sense, it might also hit the investment community and appetite hard too. That's one reason to look beyond cleantech, as some of the other opportunities we look at are analogous to the web 2.0 stars, many of which grew up in the vacuum left by the dotcom crash.

- Right now we have the money and resources to put in place radical changes – if recession (ie deep global depression) or peak oil do hit soon then would we have it in us to make those changes?

assumptions

Here are some specific assumptions we have made about the road ahead for green ventures.

Corporate sustainability, which has apparently been enjoying a lot of success and support recently, may be running out of steam. 'The most dangerous moment for a bad government is when it begins to reform.' (De Toqueville). For instance some think the big retailers may have embarked on a journey which they cannot complete, opening the door to home delivered, locally-sourced and ethical alternatives. Can a company whose embedded capital and IP is based on out of town supermarkets actually have a role in a zero-carbon local food economy? Amory Lovins has always said – don't expect a car company whose business model is based on 1m plus runs of pressed steel mould cars to build the ultra-light composite Hypercar.

So don't assume the Tesco's Shell's and BP's of the world will have all the solutions. Indeed the FTSE players of today might not make it through the perfect storm. Can an oil company really morph into an energy services provider? Just this week we have seen BP announce it is going back on promises not to mine its highly polluting Canadian tar sands for oil and Shell sell off its solar power business to the consternation of its customers and others in the solar market. Jeremy Legget CEO of Solar Century has this view - *"This latest evidence of half-heartedness or worse in Shell's renewables activities leaves me even more disappointed. Unless fossil-fuel energy companies evolve their core activities meaningfully, we are in deep trouble,"*.

That said what role can current multi-nationals play in supporting enterprise and helping reach the scale needed to meet challenges? There are interesting Corporate Venture investments going on such as RES from McAlpines and the Bioregional-Quintain construction outfit. JC Decaux used to be just an advertising firm – now they provide thousands of bikes for cheap daily rental in numerous cities across Europe and coming soon to London. Cannily they put up the investment in return for free advertising space on bus stops.

Governments will need to learn fast how to facilitate innovation. Most regulatory landscapes are defined for, and often in close consultation with, incumbents. Outliers with disruptive innovations have to fight hard to beat the in-built inertia in which for instance Governments ask car companies 'so guys what could you do for us' rather than telling industry what is needed for society. Referencing off what is around and trying to make it slightly better just is not going to work.

For example, Hypercars are super-light, electrical fly-by-wire rather than mechanical - yet current regulations do not allow for designs with a steering wheel not mechanically linked to wheels and demand crash tests built for lumps of heavy steel not light composites. Such regulations act as in-built blocks to innovation. Many of the entrepreneurs we spoke to told us of their frustrations with attempting to influence government regulations, and even when successful with having to wait years for any resulting legislation to bite.

From reform to reformation - incremental change will not be enough. *"Nothing is less productive than to make more efficient what should not be done at all."* - Peter Drucker. It's not about recyclability of plastic packaging, about better shopping bags, about avoiding real action through offsetting, about greener energy tariffs. It's about eliminating waste, changing what and how we buy, massive changes in energy efficiency and transmission and above all absolute reductions in resource use in factors of 4 or even 10. Moving to a zero-carbon economy will need more than techno-fixes and 'slightly better' policy. It will require radical reduction in resource use and waste, huge behavior change and no doubt a fundamental questioning of our current growth and consumption models. So a supermarket reducing its packaging is not going to get us anywhere near. That's why entirely new ventures, even if tiny now, may hold all the cards.

Necessity is the mother of invention. Many of the opportunities will arise out crises. Just as Honda and Toyota - now in 'the big 5' - gained their foothold in the US market in the 1970s during the oil crisis. We assume such crises lie ahead, and a very likely early candidate is the strong possibility of a quite imminent global recession. Whether sustainability will be a victim of recession will partly depend on timing. A recession soon – in 2008 – might be too soon. Companies are only just beginning to factor in things like climate change to their future strategies and have not had time to prove to themselves nor their shareholders that shifting to low-carbon makes sense. Therefore a 2008 recession might be bad news for new low carbon programs. A recession in 2012 might give us another four years grace in which companies can come to terms with the reality of a low carbon future and might not hit sustainability programs. But as with the weather (Hunter Lovins has taken to using the term *Global Weirding*, as a better indication of the extremes of weather resulting from gradual average warming) we'll have to take it as it comes.

Scale is crucial. VC investment is always on the lookout for scalable investment opportunities. So actually are those committed to tackling climate change by business means. If it's too small it doesn't make that much difference. Growth mean replacing dirty industries and competitors who deserve to wither and die! What we are talking about is business opportunities to radically change the way heat, feed, clothe and transport the UKs 60m and the worlds 6bn people – if that's not scale what is?

It's all about **efficiency**. The challenge is not just to find alternatives, they exist now, its to make them economic enough to achieve mass acceptance. You can do that by patenting a new technology, engineering the right product, by using clever service systems, by creating efficient markets. These are familiar frames for VCs. One of the interesting findings of our interviews was how similarly investors and green venture crusaders think; they may use different words but they are often talking about the same things. Something we have attempted to show in the section later on green venture models, sectors and opportunities.

Increasing consumer engagement will create a large new source of revenue for the companies that get it right. This will be driven more and more by enlightened brand communication, new Government carbon literacy initiatives and increasing media sophistication We examine in more detail in the next section data saying many are ready to buy green, how many depends on whether it offers parity (74%), or involves some trade-off (39%). And the motivation is likely to continue spreading. This will also reflect in votes and so drive radical improvement in Government action to reframe markets**.** Many are already saying the next UK election may be a *green election*.

the Consumer Paradigm Shift
– from indifferent to highly concerned and demanding solutions, in eighteen months

Climate change has never been more prominent in the public's mind. It's a heady mix of serious science and apocalyptic anxiety; analogous to the public response to the atom bomb or (early in) the AIDS epidemic. Following the release of the Al Gore movie, followed by the authoritative reports by the IPCC and the publication of the Stern review in November 2006, there has been extensive press coverage and wider discussion of the issue. Whilst there are few, if any, voices debating the evidence – there is still no clarity about the best way forward.

This is a historically new situation for everyone involved. Landor Associates, commenting on their own polling data for the last two years in the UK and USA described it as "the biggest swing in consumer attitudes ever seen"; moving from a situation in 2006 where only the few on the green fringes expressed concerns about climate change; to a situation in 2007 where they could not find a single person (in a 3000 person survey in the UK and US) who did not acknowledge the problem.

Existing consumer research suggests that consumers are confused and uncertain about the solutions to the problem. The lack of leadership and clear direction is exacerbating this and possibly preventing greater individual action. Opinions are divided between where responsibility lies – whether it is with individuals, government or businesses – and also the degree to which voluntary behaviour change can really make a difference. DEFRA is funding a range of programmes designed to promote behaviour change working with NGOs and existing networks, but there seems to be a deep seated unwillingness by government to introduce restrictive legislation. If anything it is businesses and brands who have provided leadership, setting their own standards ahead of regulation, creating simple and intuitive opportunities for consumers to do their bit, often without any sacrifice. It's possible for companies to do this because the heart of the matter is efficiency and choice; home delivery, taking the train to Paris, keeping your old mobile phone charger, not over filling your kettle… These simple actions in every day life have the potential cumulatively to transform the economy, while the regulators debate the small print.

The most recent data (eg Guardian *Green Light* report, Oct 07) suggests that when considering green consumers, you need to look at four quite distinct segments:

- **activist/pioneers** (8%) those who will adopt the deepest green lifestyles at home (such as micro-generation, green energy, boxed deliveries) and who will protest most vocally against companies who they see working against sustainability agendas
- **positive choosers** (31%) "doing everything I can" those willing to make green considerations primary, and to adopt quite substantial lifestyle changes such as how and what they drive, how and where they travel on holiday, buying local foods
- **conveniently conscious** (35%) "all other things being equal" are disposed to favour brands who are doing more for the environment provided there is no great sacrifice in price, quality or convenience

- **onlookers** (26%) recognize the problem but see it as someone else's responsibility to sort out

Some read these figures negatively, for instance there was a press release recently (from the Ideal Home Exhibition) claiming *eco-fatigue* which reported that 23% were tired of all the news on climate change. Flip it around and 77% of people clearly aren't tired of this! Looking at a green consumer market of 74% of all adults, with nearly 40% prepared to make this the primary consideration is looking at a revolution. 74% is higher than the proportion of the UK population (67%) who ever use the internet. The problem is perhaps that it has all come about so suddenly that most of us, including the commentators, haven't had a chance to take it in?

The positive choosers represents the leading consumers in many markets, yet this segment barely existed two years ago (according for instance to research conducted into ethical consumers by one of the authors for the Co-operative bank, in early 2006, the cast majority then fell into the conveniently conscious camp). The sudden emergence of this group begins to explain why – according to independent analysts – Marks & Spencers' pioneering *Look behind the Label* campaign (to take just one example) appears to have been "the most effective marketing campaign in the company's history" (Citibank).

Most companies are still – rightly – still trying to figure out what these sweeping changes mean for their consumers, brands and markets? Whether you are actually an established green company or entirely new to the issue, you cannot afford to rest on old patterns and assumptions.

One confusion to clear up surrounding the transition to a sustainable economy, from a consumer bandwagon point of view is being too loose in the use of the word 'green'. Green (with a capital 'G') is a longstanding political and cultural movement originally developing out of the Romantic tradition and a desire to escape industrial ugliness and reunite with nature. For instance one early version of green politics was the National Parks movement in the USA. Some, for instance Anthony Giddens, have argued that the likely future solutions to climate change are technological and actually the traditional greens could even hold us back, with a broad anti-science slant.

When you look at consumer data, buying what are commonly considered green products appears to be a middling priority, more often linked by mainstream consumers to health and similar (eg organic) rather than being a specific response to the threat of climate change and other looming manmade environmental catastrophes.

In a 2007 BBC survey 74% in the UK declared themselves concerned about the effects of climate change (well above the global average). When this concerned majority are asked what they are doing, practical measures to tackle energy efficiency, waste and so on predominate, with 'buying green products' only coming half way down the list - much lower than in many other regions such as Scandinavia where the traditional green movement had a stronger following:

(If concerned) Have you personally done any of the following to reduce climate change in the last year?

	UK	Global
Recycled waste	91%	68%
Saved power	82%	77%
Reduced use of packaging/bags	71%	56%
Bought energy efficient devices	63%	52%
Reduced water consumption	63%	63%
Bought green products	42%	54%
Improved home insulation	39%	27%
Bought/plan to buy smaller car	22%	20%
Encouraged friends to reduce the effects of climate change	22%	29%
Changed travel activities	18%	28%
Offset carbon consuming activities	7%	21%

(Source: Synovate/BBC, Feb 07)

By analogy with the early cultural reaction to the AIDS epidemic. People have taken on board the apocalyptic gloom and doom. They are now simply looking for solutions, ideally ones which allow them to allay their anxieties by credible reducing the risks but also continue to enjoy their lifestyles, relationships, leisure time. They are looking for the equivalent of safe sex; practical home efficiency and so forth being a better reference point than eco chic. The ideal new green venture would be analogous in this extended metaphor to *the condom*! i.e. They are not for the most part looking *to become greens* in the identity sense, i.e. living hippy lifestyles.

Not all the surveys of the UK consumer scene are as positive; some suggest we have much further to go. The recent HSBC Climate Confidence report, presented the UK (and US) situation as lagging behind the true potential world leaders in tackling climate change – in the emerging economies

I am personally making a significant effort to help reduce climate change through how I live my life today

	Agree
UK	19%
Germany	25%
France	30%
USA	23%
Mexico	43%
Brazil	47%
India	47%
China	44%

Why the gap between high levels of concern and action? One issue which seems absolutely crucial is the degree of HOPE. The presentation of climate change in the UK has been so overwhelmingly pessimistic that very few believe we have any chance of making the changes necessary (which the Stern report and others show are affordable and already available). The HSBC survey found that only 6% of Britons believe "we will stop climate change". That compares 45% in India and 39% in China.

One related view we encountered in our consultation phase is that the UK entrepreneurs and investors should actually focus on developing ideas and initiatives for Asia, which is where the heavy industrial growth is happening.

"Asia will pose a grave threat to the planet's chances of survival if it carries on as it is. Therefore any potential solution must include Asia. This is not just because of Asia's rising emissions but also they could be part of the solution in shifting towards a low carbon future with Asia's enormous consumption and infrastructure needs. I think the future for UK's green entrepreneurs is to produce products and services that will make a global difference; and right now/in the future, the UK (and others) could take the lead to serve the energy starved countries and rising infrastructure needs in Asia with innovative low carbon solutions."

Dr Kenny Tang – Oxbridge Capital

That's perhaps outside the scope of this report, but seems a point of view well worth considering.

Meanwhile faced with such gloomy pessimism – a dystopia, with no utopia in sight – the value of shining new examples, ready solutions people can adopt (and bigger ideas than 'light bulbs') which point to a low carbon economy actually being do-able is doubled. What we need is a phase – a bit like the *Space Race* – where the public can marvel at the progress being made, at the ingenuity being brought to bear.

what changes to the market will Government put in place to respond to new challenges?

As Government recognises and moves to deal with market failures expect changes to be put in place. These changes will escalate moving towards the next UK general election which one must expect to be a very green one. This will come from both central Government but also local authorities. In London the Mayor has been using his unique powers (some say an interesting form of 'benign dictatorship') to great effect with his London Climate Change Agency and congestion charges trail-blazing way ahead of Central Government on things like housing and transport.

Governments and the civil service are notoriously bad at picking winners. Innovation is not the natural result of centralized state planning – the market does this far better. But markets are also blind to certain things unless directed by the 'rules of the game' to recognize them. Government's role in this is to recognize social and environmental externalities, decide on desirable outcomes and ensure that the market is adjusted to deal with market failures. To reset these 'rules of the game' they will use a toolbox of fiscal incentives, trading mechanisms and regulations to do this. Most important (and often lacking) is long term clarity to encourage investors into new markets.

In the two weeks this paper was written the text has worked hard to keep up to date with a flurry of new Government responses to these challenges. Note for instance the radical Tory proposals on Decentralised Energy released on the 6th December, the Government's response on the 9th December in laying out (re-heated) plans for wind energy revolution and the detailed Quality of Life review[6] which has put so much pressure on the Brown Government. In the very same week Australia finally ratified Kyoto and the US Senate and House of Representatives both voted for ground-breaking new proposals on climate change and energy which could mean radical shifts in energy efficiency, low carbon energy production and a 70% by 2050 target setting the US ahead of the UK's targets. No one can argue that the momentum is doing anything but growing for radical, cross-party, multi-lateral change.

Also recently peak oil has been raised as a reality by the CEOs of two major oil companies (Total and Conoco-Phillips), a former head of exploration and production at Saudi Aramco (by far the world's largest oil company), a former chairman of Shell, and a former US energy secretary. Peak oil has also recently featured in the Wall Street Journal, Time magazine, and for the first time - on the Today Programme and Newsnight.

It would be hard to argue that we do not have a tidal wave of green market framework changes coming. But don't wait for them or you risk missing the boat. The clever companies and investors are gearing up now to be ahead of the curve and capture new markets as they emerge. Risky of course, but would VCs have it any other way? Amongst these changes will be:

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[6] www.qualityoflifechallenge.com

New regulations such as:

- The UK is to have mandatory emissions reduction targets set by an independent Climate Change Committee
- Planning law will stipulate no new coal power plants without full carbon capture and storage
- Under the Merton Rule planning law will stipulate percentage of new build to be powered by renewables and district CHP
- Moratoria on new motorways and airport runways will shift transportation markets
- One lane of each motorway to be set aside for national system of electric coaches
- Building regulations will stipulate all new buildings to be zero carbon
- Sub 100g/km emissions targets for EU cars will drive innovation in the industry
- Combined Heat and Power will be a legal requirement for all new power plant
- Product stewardship and take-back will become the norm
- Carbon and strategies for its reduction will become required reporting for all listed companies and for pension funds

New market-based instruments, fiscal incentives and trading mechanisms such as:

- Emissions trading caps will be far tighter driving up the price of carbon steeply
- New industries such as aviation will enter trading making aviation far less competitive and alternatives e.g. train far more competitive
- Carbon taxation across the economy will also drive the price of carbon steeply
- A heat levy will radically influence new power plant design
- Feed-in tariffs will drive rapid increases in micro-generation and renewables
- Council tax and stamp duty will encourage radical energy efficiency measures on homes and buildings – both new and retrofit
- Purchase tax shifts (plus a possible $200/barrel oil price) which mean low carbon cars are the only sensible consumer choice
- Large tax disincentives for flying
- Landfill tax will escalate sharply
- Personal Carbon Allowances might become a reality with trading between people on everything from travel to energy

Huge investment from the state in low to zero-carbon infrastructure

- High speed cheap efficient rail
- High voltage DC long distance grid linking UK to Sahara and Iceland
- Massive shift of the £150bn/yr public procurement budget for goods and services in UK
- Capital grants for energy efficiency will increase

Large public procurement budgets currently totaling £130bn/yr in the UK on goods and services including:

- 300,000 public sector car fleet costing £2.2bn/yr
- 34% of all non-domestic new buildings
- £1.8bn/yr on food for hospitals, schools and prisons

what will be the key types and sectors for high growth green ventures and what are some shining examples of today?

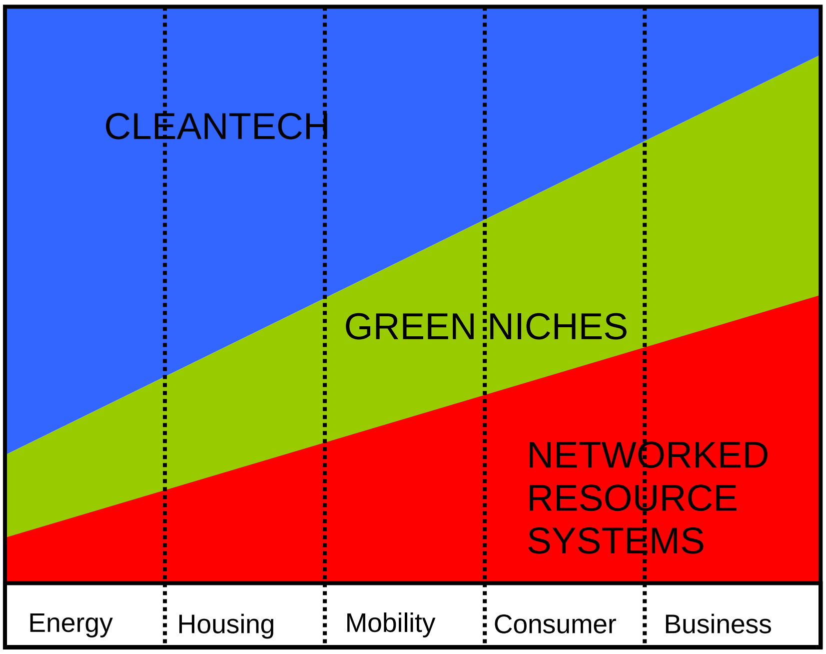
Three types of high growth model

We have conducted an informal review of existing green ventures in the UK. It would be interesting to conduct a more thorough formal analysis and survey, but at this stage the findings should be understood as *a point of view* - after all the key thing is to look ahead.

The examples quoted are in some cases early stage, small and by no means all will become successful – these are not specific investment recommendations. We are using these to illustrate the *types* of business we think could experience fast growth and hence both fill significant gaps in a future sustainable economy and also provide high returns for venture capital type investment. For instance, the electric van company we have picked – Modec - has only sold several hundred vehicles to date. They have won awards for their designs and have 15 vehicles on test with Tesco. But the company is only a year old. Why include them? Because with major customers such as the Post Office declaring that (in order to meet their own sustainability targets) they intend to buy *20,000* new light electric vans, *someone* in this space will experience high growth and returns.

Another thing to mention is that the sustainable business opportunities – just like all the many problems we face - are incredibly diverse. Ones we looked at ranged from an invention to generate electricity from the gas flow in pipes, to a new grocery store which doesn't use any packaging, to a new technology which enables better recycling of the slurry from solar panel production (SiC Holdings; €50m round Oct '07). Any examples we picked would necessarily be partial. We are not trying to indicate the definitive hot sectors or companies to watch. What was more important to us was to trace out a – largely as yet unfilled - opportunity space.

The conclusion we came to in schematic terms looks like this:



The vertical axis is a subjective judgment of scale, importance, potential – it is qualitative not quantitative. The horizontal sets out five very broad 'sectors'. The three types shaded areas indicate different sorts of model, which have more or less applicability in each sector. One thing the reader will notice about this chart is that – given the preponderance of funding to date has been in Cleantech - you can tell at a glance that (without understating its scale and importance) we are going to point to opportunities beyond this.

Many of the sustainable businesses we came across in our research but have not covered in this report are low growth private concerns, for instance which reapply existing technologies or products, and exist within a local area or similarly uncompetitive space. These are not suitable for venture capital type investment. Not only do some qualify as what VC's call *lifestyle businesses* (because they don't want to grow much), but others are antithetical to the notion of traditional funding anyway because it doesn't accord with their values. As an aside, we reckon that pretty much all the quality businesses we looked at do put making money second, behind their main purpose, which is in some way to tackle the problems of the gathering environmental crisis or social justice, or both. This arguably makes them more likely to succeed as well; more likely to be future-proof due to be tuned in to the trends we highlight in this report, more likely to win green tinged contracts or customers, more likely to get their product or service right, more likely to gain public recognition, more likely to become the prime example or first mover in their class, more likely to attract and motivate talent.

When you hear some VCs speak (John Doerr springs to mind) you even wonder if they are more likely to attract investment? This is a time for passionate driven cause-like companies. There is little room for cynical opportunism of the 'we sell PVC double glazing but now we can sell it on its green creds' sort. The real distinction is between those companies that also aggressively seek profit and growth, as resources to enable them to tackle the situation in a bigger way – vs. those that don't.

The low carbon economy does need many of the littler, less ambitious businesses too, whether they be installing solar panelling, green printing presses, recycling office waste... But the nature of venture capital (the high cost base for due diligence and so on, plus the appetite for high risk, high return) means that other sources of funding, either from government bodies, trusts, networks of private individuals and indeed straightforward debt are likely more suitable.

We found three types of business, which we believe can - and should - experience phenomenal high growth over the next ten years:

- **Cleantech.** A well-known sector. By 'cleantech' we mean products, services and processes – that reduce or eliminate the environmental impact of currently available technology through increasing resource efficiency, improving performance and reducing waste[7].

- **Green Niches.** By this we mean the booming demand among a significant (30%+) segment of not only private consumers but also corporations, local governments and so on, for products and services which are substantially better in green terms. Expect this 'niche' to explode. These greener-options-only buyers include the UK public service and its entire budget for public sector procurement, so when we say 'niche' we do not mean small, just differentiated and positioned against the need of a particular segment. This is the definition of a niche within marketing; a subset with a focused appeal. Niches are usually highly profitable and well defended by loyalty and relevance, but the other factor with green niches is the explosion of mainstream consumer and business interest in buying things for green reasons.

- **Networked Resource Systems.** A key example being the potential for the internet to be deployed to do what it does best – to create efficient markets. Carbon trading markets are the prime existing example. But many other new ways of networking resources, even power generation, also fit under this heading.

By looking across various sectors, unsurprisingly, you see a different weighting of these different models (difficult to quantify, as this is after all pure futurology on our part).

In Energy, naturally it's mostly cleantech.

In business to business sectors at the other end of the scale networked resource systems look more likely to predominate. For a start there is carbon trading. But also the potential to bring the SME sector which accounts for 97% of all businesses in the UK out of the dark ages, not only in energy efficiency and other sustainability measures, but also in the economic efficiency of their procurement, credit, cash flow and so on.

There is a green niche play consistently across most of the sectors, but heavier in those sectors to the right of the chart where customer (consumer and company) choice play the leading role (rather than as in energy, government regulation).

In each of the five very broad sectors, we will explain in more detail how each business model might apply and illustrate this with some real world examples. It's only a sketch, but hopefully it will serve as at least a useful way of contrasting the likely main strategies that may make the new entrants

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[7] The definition given in Clean Capital - Forum For the Future 2006

successful in different sectors (and we have ignored large parts of the economy better left to BT and so on, at least for now).

Energy

This is already a booming sector for investment, acquisition, IPOs. But it is also only just starting and many gaps exist even around the most hyped and funded areas.

Cleantech

The big plays are happening in energy production and transmission - what does the future look like?

Energy transmission

- The future is not just decentralised off-grid - the big prize is either high voltage DC across up to 4500kms, and/or an efficient means of electricity storage; both solutions to the uneven generation properties of renewables
- The idea of a global DC grid has been endorsed by Al Gore, presented to WEF 2007 and nick-named the 'electric hypergrid', 'supergrid' and 'new worldwide energy web'; perhaps that's for both its functional benefits (not only evening out supply, but also enabling us to put solar panels in the Sahara rather than the gloomy UK), but also the symbolic power of this massive exercise world cooperating to tackle climate change.

Energy production

- Diversity of type and location of power are key to getting smooth supply. When the wind does not blow in North Sea it does in Irish Sea and if not then the sun might shine in Sahara.
- Renewables are the future, wind, wave, tidal, solar thermal, solar PV, waste biomass – new technologies are still being found (algae etc).
- However there are significant questions over US and EU rush to Biofuels. ("Deforestation Diesels" as they are known in the NGO world!)
- Micro will not always be the solution, micro-wind can be 10 times more expensive per unit output than macro - think super-grid wind in North Sea and Irish Sea
- Heat is key and heat-grids will become common
- Carbon Capture and Storage inevitably has to play some role and new technologies need to be found and could be hugely profitable but there are still doubts about how safe storage will be
- High voltage long distance DC grids open up the use of solar thermal in Sahara and geothermal in Iceland to power UK

Current shining examples – Energy/Cleantech

Atraverda Bipolar batteries – a classic example of a patented greener technology with application to a global multi-billion market. Atraverda have invented "the first commercially viable bi-polar product that makes lead-acid batteries smaller, lighter and more reliable, serving a host of markets including standby power, motive power, military, telecoms, automotive including hybrid electric vehicles and aviation." The key thing from an investor point of view seems to be halving the amount of lead used; the price of lead has been skyrocketing. The technology also reduces carbon emissions in manufacturing. Atraverda received first round of $12m in 2004, and in Oct 07 a second round of $21.5m.

Windsave – A Glasgow based startup founded in 2001, which has won a European green business award. Windsave has developed its own design of wind turbine for home installation without the need for planning permission. Windsave designed a system which is affordable (payback within about 8 years) and which uses a unique inverter box to plug straight into the ring main, supplying 100-200W into the base load (used by fridges, phones and so on) rather than relying on battery storage. They are ready to supply in mass volumes, have deals with B&Q and EDF, and installation and service suppliers. Windsave is thought likely to IPO in 2008.

Green Niches

What about the individuals and businesses who want to take the lead in going green, and are looking at alternative energy arrangements? What sorts of businesses will meet their needs?

And also who has the right profile to attract these customers over the big energy utilities who are increasingly playing in this space with 'green energy tariffs' and their offer of energy services, to replace (necessarily) declining energy revenues?

And remember what might be niche today could become the norm tomorrow as Governments reframe the markets and new green consumers demand new services.

Current shining examples – Energy/Green Niches

Good Energy – founded in 1999 by Julia Davenport, Good Energy supplies energy that is 100% from renewable sources. It has 20,000 customers. The energy is sourced from a mix of solar, wind and hydro generators using small and medium sized sites. A unique feature is the way they reward customers who generate their own energy, paying for every unit of energy produced, even the units, which the customer uses themselves. The company has established itself (alongside Ecotricity) as the choice of dark greens, being recommended by The Good Shopping Guide and numerous ethical brand partners.

Solar Century –design, install and maintain tailor-made solar PV systems. Solar Century is the UKs leading solar energy company, specialising in building integrated photovoltaics. They work directly with architects, housing developers and engineers throughout Europe to deliver large-scale renewable energy and carbon reduction solutions. For home owners, they have built up a network of recommended installers, accredited by the EST (Energy Saving Trust), who are fully trained to install solar thermal and solar PV systems throughout the UK. Solar century recently raised £13.5m.

Networked resource systems

If the current buzz about global DC grids is to be believed, this may well be one of the leading ideas in Cleantech in coming years; overcoming the problem with large scale renewable energy generation that it is subject to variations – imagine, for instance if a freezing fog descended on the UK, damping both solar and wind generation. A solution could be to use global long distance DC power lines.

That's a literal shared resource network. But the potential for networks of the information technology variety to enable better energy efficiency is also apparent in some clever new schemes being developed to time the operation of individual Smart meters and devices, like fridges, to stabilize the national grid, smooth out peak power requirements etc.

Shining examples – Energy meets Networked resources

TerraWatts and GENI – hypergrid initiative "A global energy network makes enormous sense if we are to meet global energy needs with a minimal impact on the world's environment. Such advances (in long distance transmission) may even make possible the visionary suggestion ... that the Eastern and Western hemispheres be linked by underwater cable to assist each other in managing peak energy demand, since the high daytime use in one hemisphere occurs at precisely the low night time consumption by the other." *Al Gore*

Dynamic Demand – another hot topic recently, as urged for instance in Friends of the Earth's response to the government Energy Review. It is claimed by the Dynamic Demand pressure group that for the cost of £5, fridges and similar base load devices could be operated at the right times to smooth the national grid, by detecting (from the 50Hz AC frequency drift) when excess power is available. The technology exists (it was patented in 1979, that patent now lapsed). It will be even more relevant as more renewables are brought on line, leading to greater fluctuation. The development of this sector would be stimulated by proposed government regulation for instance to mandate inclusion in new devices. But there is also a lo-fi version that has been touted by green design consultancy More Associates; a simple web 2.0 widget style service, which tells subscribers minute by minute, when would/wouldn't be a good time to put the kettle on!

As a footnote and slight corrective to the enthusiasm for energy investments and ventures… A key topic which came up repeatedly in discussions with entrepreneurs in the Energy sector was their frustrations with the pace on unreliability of regulation. The pioneers in this field often find they are spending a great deal of their time attempting to help draft government policy (one described this as "like attending 50 episodes of 'Yes Minister"). Yet so few of their suggestions find their way into policy and those that do can get caught in a bureaucratic quagmire. Windsave, for instance, saw helpful new regulations on wind micro-generation actually passed in Parliament 18 months ago, only to be held up ever since while DEFRA looked into potential conflict with EU noise regulations.

This is serious stuff for such businesses and also for their effectiveness; for instance you can only mount wind turbines currently below the roofline without planning permission, but if you mount it higher there is a substantial improvement in performance. How to get planning permission regulation rewritten in a hurry though? One thing is for sure – it seems that competition to be green is changing things fast and parties of all colours around the world are fast learning they need to change gear.

One part of the case for investors looking beyond cleantech is that you can do clever internet based plays without needing to alter the skyline or appliances regulations. Of course you also need a business model. But if you strip away the technology, what we are often up against is human behaviour and the need to redesign life. No amount of energy efficiency improvements in generation can stack up against reducing consumption. This is the idea which has driven the Californian Negawatt Network from (IPO'd) EnterNOC which rewards customers for voluntarily reducing loads 'on demand' – the same idea as the kettle but on a slightly larger scale.

The genius of such schemes may be that people are psychologically inclined to want to do their bit and pull together in a crisis; like a return of the WWII catchphrase shout "put that light out". Is it really so hard to imagine, if the public were mobilized?

Resource networks exist today which are doing just that. Such as **DoTheGreenThing**, a new internet start-up which described by the founders as 'Creative content meets community for green action.' The action they urged on their (20,000 and rising) community for November was in fact putting the lights out early.

Housing

This is another huge topic and the subject of much debate, proposed regulation and so on. Here's a snapshot of some of the current topics in home energy efficiency:

- New supply relationships will emerge with Energy Service Company (ESCO) business models
- Energy service consultancy will be big business and linked to make-over services for insulation and micro generation kit through to grant sourcing.
- Low energy use appliances
- New building technology such as modular and kit homes

- Green architecture and home improvement services will thrive
- 80% of domestic energy goes on heating, UK housing stock is famously inefficient, new housing suffers from patchy application of standards
- Home Information Packs are now rolling out. Also research evidence that energy improvement costs are more than covered by resulting increases in property value.
- Home energy monitors/smart meters may prove a latchkey technology; people never bothered much about car speed before the dashboard. Also a key venture space with likely mandated supply to all UK homes.

Cleantech

Home energy efficiency is always touted around as a major component of cleantech; instead of generating more energy, it is possible to meet people's needs for warm homes, by reducing waste heat and so on. Efficiency will play a key role and can get us part of the way but perhaps only 60% efficiencies are possible and economically viable - beyond that point money is better spent on alternative transmission, production etc. The thing which makes home-energy efficiency such an attractive option to pursue with new business ventures is that it saves the planet by saving people money.

Costs and payback times for various home energy efficiency measures[8]

Method	Cost	Payback time
Energy saving light bulbs	£5	7 months
Lag water tank and pipes	£20+	1-2 years
Lagging loft	£140+	2 years
Draught-proofing	£40+	3-4 years
Cavity wall insulation	£260-380	3-5 years
Central heating controls	£125-250	2-5 years
Floor insulation	£100 (DIY)	4-7 years

It is perfectly possible and actually affordable to build and renovate to much higher standards of energy efficiency than just these simple measures. The Passivhaus standard for buildings in Germany (and MINERGIE-P in Switzerland) are standards of certification so rigorous that the buildings are able to dispense with conventional heating. In Passivhaus buildings, the cost savings from dispensing with the conventional heating system can be used to fund the upgrade of the building envelope and the heat recovery ventilation system. With careful design and increasing competition in the supply of the specifically designed Passivhaus building products, in Germany it is now possible to construct buildings for the same cost as those built to normal German building standards, (and not just in theory – its been proven with apartments built at Vauban, Frieberg).

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[8] Centre for Alternative Technology, *Energy efficiency in the home*,

www.cat.org.uk/information/catinfo.tmpl?command=search&db=catinfo.db&eqSKUdatarq=InfoSheet_EnergyEfficiency

The opportunity is to transform the energy performance of the 25 million homes in the UK. Historically according to US long-term Bureau of Labour statistics, people spend about 33% of their income on buying or renting a home and a further 16% on improving it. Those figures being from the 1990s, they would probably understate the current situation. If home energy efficiency became a primary consideration, through regulation, through perceived effect on home valuation and so on, this is a very substantial chunk of the economy indeed; with knock-on opportunities in advising, financing, installing, training and so on.

Current shining examples – Housing/Building Cleantech

Bioregional – a pioneering consultancy which develops new solutions in waste management, housing, recycling and so-on, either in JV or its own start-ups. Notable successes include their BedZed housing project – the world's largest eco-village - and MiniMills which pulps straw (farming waste) to make paper. Residents have been living in BedZed since 2002 and the project has been able to show that by using eco-construction, heating costs have been reduced 90%. The aim is now to apply the learning on a consultancy basis, working with local authorities, developers and the construction industry. Bioregional are also running courses on what the (government commitment to) *zero carbon* new homes will mean in practical terms.

Natural Building Technology – set up in 1999 to develop and sell sustainable building materials and systems into the mainstream in the UK. In particular NBT was set up to deliver high performance, sustainable building systems for the shell of the building, where the greatest environmental, health and energy performance gains can be made most effectively and easily. NBT is by now a leader in sustainable building materials delivering better insulation, high building quality and also health benefits. It also recently launched a Code for Sustainable Building Solutions; in common with many eco-entrepreneurs, influencing, and even assisting, the rest of the market to follow suit is seen as a core activity. Most materials used by NBT - such as unfired clay, heralded as the likely future building material of choice as it has better performance overall, not just energy efficiency - are fully renewable. NBT is supplying materials that satisfy or exceed the highest standards in Germany. Investors in NBT include Foursome and The Carbon Trust.

Green Niches/Housing

New homes will likely be mandated to have substantial energy efficiency improvements by regulation. However some critics point out that existing building regulations compliance is very patchy, so why would new regulations be different? Gordon Brown has promised compulsory zero carbon new homes within ten years. The Tories have gone much further.

A more positive and largely unrecognized development – a side product of the housing boom and resulting unaffordability of family homes to many young people – is a shift from building houses to building flats. That's in contrast to the USA where smaller families have been living in bigger and bigger houses. Living in small spaces represents a triple efficiency, firstly less energy and secondly less resource use (timber is another increasingly scarce and expensive resource), and thirdly 'a shared roof' (i.e. dependent on design, a reduced surface area for heat loss). A counterintuitive finding of modern studies into green architecture is that the 'greenest' arrangement is living in more dense cities than now, with mixed-use neighborhoods and so on, rather than in an isolated cottage in some rural idyll a long drive from the nearest amenities.

Greener new homes are all very well. But it is the eco-refurbishment and improvement of existing properties where the big gains are likely. In a pilot study by the government into Energy Performance Certificates, the average property with 4 bedrooms only made it into band E (band A being best and band C representing what is thought of as an acceptable average level). Regulation will play a role in this change, but in partnership with consumer choice; sellers have to test and disclose the energy efficiency of a home for sale or to rent. What this plays to is a substantial segment of the population willing to pay more for green (including a greener home). Energy efficiency improvements are a key area for governments, businesses and individuals to tackle; home energy use accounts for roughly 40% of all carbon emissions and our inefficient, leaky UK housing stock is equivalent to all of us driving not just SUVs but monster trucks. The Passivhaus improvements detailed in the last section can reduce emissions by 90%.

Pilot studies for Home Information Packs suggested that the cost of making improvements to get into the top two bands would be more than covered by the resulting value improvement. There is substantial doubt as to what will happen in the UK housing market next year, but previous market corrections have widened the gap between quality properties/areas which held their value better, and homes which are lower quality. Which is to say in a harder market, such differences may prove more telling, not less. And in the credit squeeze, many owners might be forced to sell or face punitive mortgage terms, according to the Council of Mortgage Lenders this week.

Current shining examples – Housing/Building Green Niches

Ecofirst – in addition to fitting micro generation and other sustainable technologies (e.g. rainwater harvesting), Ecofirst offer a complete home review and efficiency installation service, and run a training centre for installers in Somerset. It is likely with the introduction of HIPS (comes into effect 14 December 2007) which includes a home energy rating, the retrofit eco-efficiency suppliers will be very busy.

The **London Green Homes Concierge** service launches in the next few weeks: "Green Homes Concierge service staff will visit your home and using some advanced software, calculate your energy wastage, then recommend measures you can take to cut your energy consumption, reduce your emissions and slash your utility bills. Then, for a whole year, the Concierge Service will research and advise you on requirements, recommend trustworthy contractors, often gaining significant discounts on energy-saving equipment, and even manage any necessary home improvement work." It only costs £199, by the way, for the assessment and a year's access to the concierge service. The HIPS compatible report they throw in for this price is worth £100 alone.

Greenmoves.com – currently the UK's only dedicated 'eco property for sale' site, also covers the rental sector. It's not an estate agency, simply a listings site. But it does require those who advertise to satisfy rigorous external assessments, such as BRE. It's currently a very small player (albeit endorsed by the likes of Jonathan Porritt) but the sector it represents has a powerful rationale: the ability to help aggregate accredited green properties for sale and for rent as a trusted service to the ethical consumer segment, the ability to help green vendors and landlords to command a premium, the ability to act as a marketing channel for green home improvements, financing and so on.

Networked Resource Systems/Housing

Housing is a prime example of resources which could be much better shared. The suburban ideal of a mock country estate house, fully detached, with its own garden lawn is a poor model for sustainable living. And it is also, social history suggests, a recipe for disconnected communities, mass loneliness and so on. Human beings evolved as a communal species, we feel lost in isolation. The recent success of social networks, and the longer running popularity of 'home from home' social spaces (from the casual office to modern coffee shops) could be understood as a form of compensation for something very basic that was lost around the time that neighbours became strangers.

A revolution in living arrangements happened at the time of the industrial revolution. Perhaps a similar revolution should be expected in the sustainability revolution too? Nothing marks a break with the past than a change in basic customs of life. It is natural to associate communal housing in the modern era with hippies and communist bloc countries. But in many ages it has been held up as an ideal; in ancient Greece the retreat into a philosophical community and quieter, simpler life, in the origins of the gentleman's club, in the camaraderie of the early co-operative movement.

The new shared living arrangements could only thrive in forms which attract people, rather than repelling them. For instance funky Big Brother style hotels might offer a modern, long-term, well serviced let; a contemporary boarding house, offering an extension to the student halls experience and an alternative to living at home with parents until (as is now the average) past your mid 20s.

A Bedzed and the WWF/Bioregional One Planet Developments show a communal arrangement allows for shared, energy efficient services, cooking, laundry and so on. We may also see part solutions such as the return of the launderette; a modern facility (using waste filtration systems) could recover nearly all the water and soap for re-use. What's needed is a positive brand and service concept; for instance the bar/launderette is fashionable again in Germany, or what about a launderette crossed with a gym? (treadmill power as an energy source too!)

The principle is to share resources, or even just information about how you use resources, across a network and there are quite promising schemes already launching today, to do just this in the housing sector:

Current shining examples – Housing/Building Networks

whatdoidowiththis.com – a trading site for surplus/waste building materials. These would otherwise have ended up in a skip on its way to landfill. Now instead you can make money by reselling them. The business model is a simple fee for listing goods (£2.95 for a single listing, cheaper if multiple listings are bought). There is no quality control or guarantee, it is simply a listings site, which is well categorised for this purpose. Other benefits include being able to buy small quantities of items usually only sold in bulk, being able to find local sources, being able to negotiate a very sharp price on stuff that otherwise would have been chucked. And for sellers it is almost literally 'money for old rope'!

Onzo – home energy monitors and personal carbon management. Onzo is a recent UK start-up, and the product of a DTI grant to commercialise research into effective behaviour change, by social enterprise More Associates. Onzo is using the (government white paper-mandated) home energy monitoring market as a starting point. With the Onzo system, this will be much more than a home display. You will be able to compare your energy usage with others, explore the differences that particular changes will make and so on. Your energy company will also benefit from better customer data. The objective of the company is to make carbon management as intuitive and normal as health is today; the equivalent of counting calories. In the medium term it has broader plans, including using More Associates' 'language project' to establish more intuitive and less scientific phrases for everyday use; the equivalents of 'jogging' or 'smoothie' (in brokering cultural change by making new behaviours accessible and attractive)

Mobility or Connectivity

Mobility and Connectivity are terms commonly used in sustainability because they include the possibility of:

- alternative forms of transport
- not using transport e.g. walking
- not traveling at all

How many human journeys today are a waste of time? How many times have people traveled across the world to a lousy inconclusive meeting, full of tired and tetchy colleagues or potential partners? Firms which work on deals that move to fast and are too spread across the globe to be jumping onto planes – such as Goldman Sachs (the world's heaviest per capita user of voicemail, they claim) – seem to manage quite well! It's about instilling a culture and teaching remote communication and connectivity skills.

In the knowledge economy how many people *really* need to commute? The future is avoiding travel, more home working, video conferencing, home delivery, internet. The future is rail and coach, car pooling, car sharing, bicycles. The future is electric vehicles. But it's not just about alternative fuels and alternative modes of transport. Transport systems have been developed apparently to maximize the wastage, even for private individuals in their cars, sat in traffic jams it's a bad solution. And town planning is equally to blame. Think walkable cities no car based suburban sprawl.

Mobility is a subject where people like to read ahead – there have been travel guides almost as long as there has been writing. The new breed of travel guide is exemplified by Loco2, a student interrail pass vendor with characterful content ("we put the mental in environmental"). More functional but with a much broader remit (to encourage overland travel worldwide) is award winning site Seat61.com originally launched as a hobby by Mark Smith a career 'railwayman', but now a proper (albeit one-person) business. Plenty of interesting businesses have launched simply to provide travel information as the basis of better decisions; for instance walkit.com which gives you a walking route and directions between any two points, and the government supported liftshare.org where 300,000 members arrange to share journeys on a regular basis.

Cleantech – Mobility/connectivity

The future is electric cars with a network of battery leasing 'filling stations' which also store surplus power from nighttime wind etc. and become mobile power storage plants in vehicle to grid systems. At night and during the week you plug in and sell your excess power back to the grid. At weekends you power up and off you go.

Don't expect one fuel type to dominate in anything like the way petrol does now. Diversity of fuel use and technology will be key with horses for courses using different technology for urban than for longer distance car travel.

According to a recent consumer survey (by IPC media group) 81% of people feel guilty when they take a flight. (81% - that's approaching 'wearing fur' levels, surely). Aviation does not seem to have an exactly positive future in a zero carbon economy with techno-fixes mostly pie-in-the-sky and huge growth levels predicted if the market is left untouched by Government intervention. There is no 'hybrid engine' transitioning to 'electric car' style technology fix around the corner (although there are some cleantech schemes such as use of electric engines for taxiing, use of direct flight plans and traffic control systems to eliminate the need for holding patterns).

Boeing have just launched the 787, which significantly outperforms the ageing gas-guzzler planes. Boeing is also investigating an algae-sourced biofuel as an acceptable alternative to crop based biofuels. However there is significant doubt as to the viability of this approach and even if successful it is said to require an algae pond area the size of Maryland to make a significant contribution to the jet fuels industry. Airships and WIGs might also play a role for cross-ocean travel.

Sarkozy has recently been punchy when discussing blocks on new runways as have the UK Tories. Techno-fixes to the huge problem that is aviation are unlikely to be enough in a zero carbon economy so slower travel and staying put is probably a simpler answer!

Current shining examples – Cleantech / Mobility/connectivity

Modec - electric vans for delivery fleets. Modec, based in Coventry has won awards (e.g. from Green Fleet) and public recognition for their designs and have vehicles on test with Tesco. Another start-up is Smith Electric Vehicles whose van has been purchased for tests by Sainsbury. With major customers such as the Post Office declaring that (in order to meet their own sustainability targets) they intend to buy *20,000* new light electric vans, someone in this space will be big quite soon. 20,000 vans equates to £400m in revenues, and this from just one fleet customer. Light vans are the fastest growing type of traffic (up 39% in the last ten years, according DoT statistics). In tests of electric bike pizza delivery in Las Vegas, customers said they appreciated the vehicles being quiet, not disturbing neighbours, not emitting smelly fumes. Quietness was in fact one of the reasons why nearly all milk floats were electric, the other being that petrol engines are particularly expensive and inefficient to run under stop-start conditions. With the expected boom in home deliveries, the electric vans market could hardly be better set.

OSCar – the DTI sponsored hydrogen fuel cell hypercar. The hypercar is an idea originally put forward in 1991 by Amory Lovins at the Rocky Mountain Institute, its key feature being ultra-light materials and design. Hugo Spowers the OSCar founder initiated this project as an academic exercise. Having run a firm building racing cars for 15 years, he originally started out to write a feasibility study as part of his MBA at Cranfield. OSCar is an open source project, designers submitting ideas for the form of the car and so one – consciously modelled on the development of Linux and open source software. It was started in 1999, and reached version 0.2 by end 2005. A product – the LIFECar (Lightweight Fuel Efficient Car) is being developed for a commercial launch with BOC, Morgan cars and Oxford University.

Green Niches – Mobility/connectivity

Nothing states your identity like your car. Little wonder that cars like the Toyota Prius have become such a visible symbol of who is who in Hollywood. In the long term all cars will be much greener, for instance they might all be electric. And there is likely to be a basic regulatory standard of 80g/km imposed to be able to market a car as 'green'. Again expect these 'niche' plays to become mainstream as Government and consumers engage.

Meanwhile, how does the liberal newspaper editor get to work? CP Scott the Guardian editor of 57 years used to ride his bicycle every day through the streets of Manchester. Today Alan Rushbridger instead makes the journey down to Farringdon in a G-Wiz.

Current shining examples – Mobility/connectivity Green Niche Plays

G-Wiz – the UK's iconic electric car pioneer from GoinGreen. This is the best selling electric vehicle in the UK (with just over 900 vehicles sold in London and 2000 worldwide, it is still quite a pioneering choice). A new version has just launched called the G-Wiz I, which has improved comfort, performance (up to 50mph) braking and crash test performance. The G-Wiz is manufactured by Indian company Reva which has recently scaled up to have a capacity of 30,000 vehicles per year, from 2008. At quite the other end of the motoring spectrum is the Tesla, a Silicon Valley startup with seed money from the PayPal founder, which raised over $100m in funding and produced a car capable of 0-60 in under 4 seconds. Over 500 Teslas have been reserved. The first production models are due in Q1 2008, and look set to be *the* aspiring tech millionaire's car; a snip at $90k.

Green Tomato Cabs – Another interesting segment is green corporate customers and a good example is green taxi services. Ozo cars (which launched in 2002 in NYC as *Green Car to the Red Carpet*) is one of the largest and longest established. In London Green Tomato exclusively uses hybrid Toyota Prius's, emblazoned with their green tomato logo. The interesting angle here is their appeal not so much to image conscious dark greens (they generally cycle) but to corporates with green commitments and cab accounts. Green Tomato pride themselves on not only being a green option but in representing good value for money, especially on longer journeys – they claim to be cheaper than booking a black cab nearly every time. Launched in 2006, eighteen months later they now have a fleet of 60 cars. Corporate clients such as BSkyB ensure steady business, while on the consumer marketing front they used a clever promotion delivering one card per street, asking people to write down the number and pass it on to their neighbour; it saves a fortune in direct mail costs, but more importantly sends exactly the right signals to their consumer segment; something innocent is also a past master at (a *buy one get one tree* promotion etc.)

Networked Resource Systems – Mobility/connectivity

Lift sharing and hitch hiking is as old as the wheeled vehicle. But it took the arrival of the internet and GPS to create the modern city car club which is as simple today for members as locating a car that's available in a nearby street (online), booking it (online) and then using it.

The broader mobility market will see many more such systems innovations, where the need to be somewhere is met in different ways than private transport. We have also seen bike sharing clubs (Cyclocity) lift sharing communities (liftshare.org with 300,000 members) and will almost certainly see innovative services in future, such as public transport with smart routing systems to enable it to collate a shared route and drop off passengers just like a taxi. Other innovations include price per km leasing and pay as you go insurance.

Just as important are the services which enable people not to travel, or not to travel so far. Videophone is one we will cover as an example, but think also about innovative UK holiday concepts, the virtual tourism of shared spaces (given ten years to reach photorealism, physical feedback etc.) and new ways to host conferences and so on.

Current shining examples – Mobility/connectivity Resource Networks

City Car Club, Zipcar, WhizGo and StreetCar – successful car clubs. Giving up your car is an idea which still meets mainstream resistance, according to government research. But that's because people imagine a service that would be inconvenient, a step down from queuing at a bus stop in the rain. The reality of modern city car clubs couldn't be more different. If you are an occasional car user its perfect – a car only when you want one, for something like the cost of a taxi, with no worries about parking at home etc. It is of course only a different take on rental, but by putting the cars out on the streets and enabling people to pick them up, and by having a club concept and then charging by the hour (under £4 an hour is typical) a very different experience is created. The green point is that by sharing resources rather than each owning them we make more efficient use of them. But it is the convenience of the service not the effective shared ownership that really impresses with these schemes. Future green cars are quite likely to derive almost as much of their green efficiencies from innovative service systems, as from the performance itself.

Eyenetwork – billed as the future of videophone and growing at 20%/yr. Eyenetwork is an video conferencing booking service with over 3500 affiliate video conferencing public bureau around the world, all available for hire by the hour. "All you need to do is to tell us the location of your own site and the one you want to book with us. If you do not have your own video conferencing equipment we can find a facility near you AND at the other location. One of our knowledgeable bookings coordinators will discuss your video conference requirements, confirming all details, such as how many people and how many locations, peripheral equipment and any extra special requirements. No need to waste time checking availability, prices and technical issues - we do all that for a single booking fee." As well as enabling one off videoconferencing meetings between locations (at £145/hour, each end) the service has been *discovered* for particular applications. For instance, virtually all the high end search firms use this service to interview global candidates, linking their own state of the art facility to Eyenetwork locations worldwide.

Eyecatcher videophone is another noteworthy launch in this market has been the t. Co-founder Paul Dickinson (also Chair of Eyenetwork) observes: "The Eyecatcher is a landmark product. It represents the key breakthrough in video communications. Like the Model T Ford, it is not the biggest or the most expensive, but it is by far the best design, and we expect, like Ford, to sell millions."

Consumer Products, Services and Retailing

This is admittedly a rather broad category, although much of the central themes cluster around the notion of shopping which is a central pillar of consumerism and perhaps (albeit rather sadly from some perspectives) the defining ritual of modern life.

The ritual nature of shopping has been carried over and reinterpreted by the online stars of the last ten years; eBay, Amazon and so on. Their great success has been normalising something scary and new (e-commerce as in the 1996 view that "I'll never give my credit card details") through comfortingly familiar habits like 'items I'm watching' and 'reader reviews'. In the process they have created something new; for instance a mass second hand market in the USA and the 'long tail' inventory, making short run books commercially viable again.

Green consumerism is an important subject, partly because it is such a central ritual and sends so many signals to ourselves and others (e.g. politicians, CEOs) about what we value. According to a recent Co-operative Bank report (Nov 07) on ethical consumerism in 2006, ethical products and services accounted for £32.3bn in the UK. Relating this to the four consumer market sectors in this report, the split is as follows:

- Consuming (Food & Drink + Fashion + Personal products + Local shopping) = £8.9bn
- Green home including green energy = £6.2bn
- Eco transport and travel = £1.7bn

In other words, presently green shopping is as big as the other three together. Although you have to be slightly careful as the 41% saying they are using their car less and so one will not have been counted, only behaviours which are labelled as green purchases are. So the survey measures green spending and not all green savings. Nonetheless £32.3bn is a striking statistic (roughly half the size of the total B2C spend online across the whole of Europe, and look how much investment that sector has attracted) and tallies with the massive green efforts of mainstream retailers such as M&S, Tesco and Walmart.

Slightly less good news for the newly green retailers in the long term is that inclusion of 'local' vegetables within their range, reduced packaging, energy efficiency and refusing a shopping bag or two, pales into insignificance compared to the massive cost and emissions savings which go with home delivery, particularly if an increase in this sector leads to efficient universal delivery firms (imagine a service which visits every street every day, like the old milk floats). Truly local produce – why do we import as many chickens from Holland as we export to Holland? – would make a huge difference but one wonders what role just-in-time out-of-town national supermarkets will play in that. Given the stalwarts of UK retailing rely on their distribution strength and land bank to defend market share, the encroachment of delivered green services small and large is a significant threat.

A similar paradigm shift in durable goods could see the rise of service systems and new ownership models; of which the simplest example is *don't buy, rent*. The successful and popular consumer businesses such as Bag, Borrow or Steal ('Netflix for handbags') show how this can be done with panache, and far from seeming a hair shirt. The ability to create P2P (peer to peer) networks of sharing – such as the 4m member online green hit Freecycle (don't throw it away, give it away) – also raises the possibility of building social capital, community, enjoyment of being back in the daily life of people who live nearby, with a *Gift Economy* of exchange building social ties.

Will a few million consumers buying slightly greener products but still en-mass help dematerialise our economy and respect absolute limits? That's the subject for a whole other study but we think not. Buy-nothing Day and other such initiatives are gaining ground and our worship at the alter of 'more' may not last forever – may not be able to.

Cleantech/Consumer Markets

It's a slight stretch but the nearest equivalent of 'CLEANTECH' in consumer markets (despite solar panelling and cactus like plants on selected Walmart roofs, and innovations in chiller cabinet efficiency and so on) is arguably the use of material resources.

So far food, and to some extent personal and cleaning products, have led the way, while ethical fashion has until now proved a niche concern, with mainstream consumers who regularly buy green food and groceries, not giving '£1 t-shirts' a second thought (recent IPC research showed that literally almost no-one thought about the environment when buying fashion, although that may well be set to change in 2008).

In food key themes include:

- Think footprint, low-meat, healthy, local, in-season, organic, packaging free, waste not, want not, Fair Trade/better terms for farmers and home-delivery (see section below)

- Think eliminating packaging waste (and hence much of the need to recycled). e.g. Unpackaged has opened one store this month – an ethical grocers where customers have to bring all their own packaging along to fill at the store – it's only a little shop, but then so was Body Shop once.

- New heat and drought resistant crops are attracting a lot of interest – but also be aware of the controversies around GM

In non food markets, a key theme is dematerialised products:

- Think zero-waste

- Resources-in and waste-out will get far more expensive

- Life-cycle analysis, cradle to cradle style consultancy and industrial ecology make-over will thrive

- Product to service business model shifts will thrive as reuse and share will mean producers need to become services

- Conspicuous abstention, nu-austerity, nu-luxury, authentic, less is more, make do and mend, eco-bespoke and eco-relevant will define the future

- Authentic fits well with local – think farmers markets and farm shops where consumers meet producers

- It's not all hippy jewellery either. For instance check out Giffords (innovative products for instance for the equestrian industry) from waste wood, and Greenworks which resells and where necessary (because it's old or broken) finds new architectural uses for old office furniture.

In both of the perishables and durables markets, the key word which will define much that happens in the next ten years is LOCAL. That doesn't mean fragmentation back into local concerns which lack centralised buying muscle. Rather it could mean localised experiences, local entrepreneurs, local sourcing of materials and ingredients, local community links and social ventures, whilst still employing national scale and efficiency in key procurement and distribution functions.

Imagine for instance that instead of the ubiquitous chain (Starbucks), a service company enabled local café's to compete on décor, staff training, costs through shared services. Perhaps a revival of the co-operative movement is in order, this was created to combine forces and yet serve local communities by getting local working people a better deal. Or it's just a different franchise model, one which neatly avoids the McDonald-isation of every high street but delivers better efficiencies.

Current shining examples – Consumer Markets

innocent smoothies – the important thing about this brand (ahead of many worthy corporate commitments to change food retailing) is that it has done for ethical business what Body Shop did in the late 1980s. It is probably the most charismatic brand in the UK today, and certainly one of the most successful entrepreneurial ventures in consumer markets, well on its way to achieve its stated ambition to be the biggest player in the juices market in Europe, especially now it is expanding overseas. It makes a great product, without compromise (it is still the only mass produced smoothie that isn't made from concentrate) and it has good ethical policies on sourcing, materials and so on. Just as Sony was invented with the vision of showing the world that Japanese products could be great, innocent has done the entire ethical products sector a favour. What will be even more interesting is if and when they decide to apply one of Britain's best-loved brand names to new ethical products and services?

DEMATERIALISED - Worn Again. *AntiApathy* in partnership with Terra Plana invented a recycled shoe brand called Worn Again (trainers which are made out of old trainers). They are extending the brand into other product areas, for instance they are looking at making handy little wash bags out of old airline seats. They are aiming to find their iconic product – their equivalent of Caterpillar's yellow boot: If they succeed, it's the company in this report most likely to make the front cover of Time in two years time. This is also a company who throws legendary parties and public events – including their staging next April of the first major ethical fashion awards, complete with supermodels and big name designers on show. They are behind *TheNag*, who's current campaign is a viral email recruitment game, attempting to get Victoria Beckham to join, through a chain of friends and acquaintances of the existing members who might know her!

LOCALISED The Wedge Card – launched by Big Issue founder John Bird, this is intended to protect the local stores still trading, by giving them their own version of the Tesco Club Card scheme. It's an important initiative in its own right, but you also have to wonder whether many other David vs Goliath plays will emerge (using the technologies that mean – in the age of Linux and YouTube – it's actually quite an even fight)?

One thing that's been evident talking to values led companies of this sort is just how suspicious they are of traditional investment and funding models. The consensus view seems to be that while you need capital and profit to achieve your ethical aims, planting 'a capitalist' at the heart of your board runs too much risk of distorting your venture with the need to make a short term return.

It's apparent that for many such companies (when looking for scale and influence beyond their means) have preferred the trade sale/partnership route taken by Green & Blacks, Howies, Aveda and many others.

Cleantech/Green Niches

Many former green niche product types, such as organic cotton, have gone mainstream (from total obscurity) so fast that the specialists must be left scratching their heads. But there is still a big difference between a Howies t-shirt and an M&S organic cotton one. The difference is not just image. The green lifestyle brands are tribal concerns, people feel passionately concerned and involved.

The area where the distinction between sustainability policies and true green brands may really bite is in green consumer retailing, especially when the new ventures start with mainly online retailing where their distribution weakness is less of a factor. Many businesses in this sector cater to local markets but there are also a growing number of successful larger online plays.

It seemed better in this case to reflect the breadth of interesting ventures than focus on the particular models of a couple of examples, although there are some very interesting and innovative plays within these among the recent entrants:

Current shining examples – Niche Green Retail/E-tail

Natural Collection – leading green products e-tailer

greenzone.tv – 'QVC for green' IPTV meets g-commerce

Tree2mydoor – 'the leading green gifts company'

Gossypium – stylish innovative ethical retailer

Riverford Organics – a leading boxed local food delivery co

Eco – Chiswick green store/advice centre

Unpackaged – a new shop where you bring your own packaging

So Organic – organic food award winning retailer

Planet Organic – yet another award winning organic retailer

Networked Resource Systems – Consumer Markets

This is one of the most exciting potential areas for green venturing, from a cultural innovation point of view. The potential is to 'upgrade' consumerism, enabling people to share resources while still meeting their functional and cultural (e.g. identity) needs.

There are many interesting plays already of this sort. Freecycle has already been mentioned. Other virtual markets (i.e. connecting 'buyers and sellers' in innovative ways) include a number of recent launches of peer-to-peer rental markets such as Zilok (just launched in the US) and the UK Seedcamp winning Rentmineonline.

In future we may also expect intermediaries which close the loop (for instance what if an Ocado style joint venture rented out, reclaimed and refurbished IKEA home furnishings?) and which act as aggregators – in same the way that Money Supermarket disintermediates and reintermediates financial services. Speaking of which another important class of consumer market launches could involve ethical and environmental financial services – i.e. a bit like Zopa. Another indicator of 'what it might be like' could be Kiva.org based in the USA, which brings the microlending model to online philanthropy.

There are also significant new ventures in the social network space, applying the latest community and viral mechanics to green lifestyle change; notably (in the opinion of the authors) DoTheGreenThing, Low Fly Zone, WeAreWhatWeDo (responsible for Change the World for a Fiver and the *I'm Not a Plastic Bag Bag)* and iCount. The big media companies are also exploring the same space, with Discovery's acquisition of Treehugger, and Yahoo Green portal being two notable examples.

We are planning a whole separate event in the new year entitled 'When Green Meets 2.0' to explore all of this in more detail. For now here are a couple of examples, which have launched in the last few weeks and may serve as markers:

Current shining examples – Consumer Resource Networks

Localfoodshop.co.uk – just launched, a 'virtual farmers market' online. Big Barn one of the two companies behind it is an internet company aiming to reconnect local producers and consumers. BigBarn has been trading for 7 years and is now 'the leading local produce website' (Daily Telegraph Feb 07) with over 7,500 local producers listed as icons on maps accessed by typing in a postcode. The other partner is f3, a not for profit, co-operative Community Interest Company, with members comprising leading experts with UK and international experience in the field of sustainable food and farming, and enterprise support. f3 has been established since 1999 and has carried out more than 140 projects in this field. The project was funded by the Welsh National Assembly and over 90% of the purchase will go direct to the producers. Localfoodshop does not handle the goods; individual orders will be fulfilled by the sellers, with low courier prices through a deal arranged by Localfoodshop. It will also facilitate orders through local distribution hubs and enable neighbouring producers to organise shared delivery.

Evo.com – this is a US based ecommerce aggregator, so is arguably out of scope for this report. However we include it, since it just launched and has a groundbreaking model that may prove a template for others to follow in UK/Europe. The idea is that EVO does the ethical research for you, for instance it offers 5000 quality green toys from 50 retailers. Evo have already evaluated 2 million products, in order to offer 100,000 on their site. Categories include recycled (refashioned) gift ideas and solar, as well as all the more obvious 'green consumer' product categories. It seems a highly significant play because it has a potential huge scale, because it does the ethical research for customers (a major gripe being not knowing which version of 'green' to buy, which supplier or labeling scheme to trust), and because it is an aggregator, drawing together thousands of much smaller players into one. It's also a great looking website, well worth checking out.

Business Procurement and Services

A large part of the economy consists not of consumer purchasing but of business to business transactions, purchases, services; from management consulting to catering, from reinsurance to retail suppliers. This is not so much a sector as a very fragmented major chunk of the economy. Nonetheless it has three vital features of crucial relevance to building a low carbon economy:

- **resource use** – the sheer scale of business-to-business activity footprint
- **inefficiency**, particularly in the small and medium enterprise sectors, where companies pay over the odds and also are wasteful in environmental terms (e.g. energy efficiency)
- **a domino effect**. If a large company or local government institutes a *carbon neutral* or similar type of policy, this inevitably forces its supply chain to follow suit.

The big story in business news of last 2 years has been about these corporate carbon neutral commitments. Yet small and medium enterprises account for 60% of employees and 51% of turnover in UK. A Carbon Trust survey found that 60% of SME's knew they could reduce Carbon emissions through simple efficiency measures, yet 70% have done nothing – but with consumer and Government changes this is shifting fast.

Now it's time for the little guy to lead on sustainability:

- Save money
- Get certified as green
- Motivate staff
- Qualify for contracts with big orgs/public sector
- Not something they can put together piecemeal, or in isolation.
- Lots of potential managed procurement type plays e.g.

- Purchase power aggregation
- Energy efficiency incl IT
- Transport, mobiles etc
- Certification of organic

This is a huge subject, massively complex and diverse, and also as the Carbon Trust survey showed one of the least progressive parts of the future low carbon economy so far. From an investment and venturing point of view, it's also therefore perhaps one of the ripest for reinvention?

Cleantech

Two sorts of venture seem most likely to enable progress from a fundamental resource point of view. One is providing greener products, which make financial sense as well as environmental sense. The other is consultancy - helping companies analyse their situation make better choices of cleantech type products and systems.

Current shining examples – Small Business / Cleantech

Shuttlepost – reusable envelopes for both internal mail and business post and parcels. UK businesses use hundreds of tonnes of envelopes everyday, and recycling of these is inefficient, with many padded hybrid envelopes going direct to landfill. The Shuttlepost envelope is a new patent pending invention manufactured entirely in the UK (the company is based in Ebbw Vale), there are no special clips required just a Shuttlepost label, the envelope is water resistant, tear resistant with a paper-like texture. It's a very simple idea, but it also has the POST-IT NOTE factor?

BestFootForward – a carbon footprint analytics and consulting firm. Founded in 2007. Winner of the Queen's Award for Enterprise in Sustainable Development in 2005. Is a leading player in the emerging field of carbon accounting and is an acknowledged leader in helping SMEs as well as good companies understand their impact.

Green Technology Initiative – a non-profit which helps businesses move towards sustainable IT. Founded by Carrenza, EDF, Global Crossing and others. The initiative is a non-commercial organisation providing the business community with free advice and information.

Green Niche Business to Business

The are a growing number of green businesses, who naturally wish to buy green themselves. And so there is a growing range of green services aimed at this market…

Current shining examples – Small Business Green Niches

The Hub - green managed office space, with premises in London, Bristol, Sao Paulo, Johannesburg, Rotterdam. It's billed as an incubator for social ventures and it does indeed seem to attract many fledgling ventures at the heart of the movement including a number featured in this report. It's also a showcase space in terms of its own sustainability and design. And if the rest of this report is right, there will be a boom in ethical and environmental start-ups in the next decade; if The Hub chose to, you can easily imagine it becoming *the green Regis.*

Make Hay Ethical e-Media – web design and services for 'companies who want to make a positive difference'. The company was founded three years ago and their wind energy powered *green web hosting* service was launched last year. It's a small company, but the founders are well known in the green blogging space (for *GreenGirlsGlobal* and now *GreenGuysGlobal*) and if not necessarily a high growth venture, it's a good indication of how green-to-green businesses will tend to look and operate in future.

Green Networked Resource Systems

This could be huge. And in one sense – carbon trading – it already is.

How to help small businesses transact and share resources in a much more efficient way? The suspicion is that an idea as big as microfinance, but geared to sustainability, is on its way. It would dramatically cut the costs and carbon impacts of small businesses and free them up to concentrate on what they do best. It will make things easier not harder. It may be assisted by regulation but its unlikely to be a top down play.

Just as an indication of the sort of thing that could mean in practise…

Current shining examples – Green Networked Resource Systems

The Laundry – an award winning small business paper recycling scheme (another scheme involving both More Associates and Bioregional, both mentioned earlier). From Bioregional's website: "Most paper recyclers have a minimum collection of 6-8 sacks of paper, far too much for a small business to generate or store so it's cheaper and more convenient for them to throw it away. Often they do not have waste management staff and may think that the waste they generate is so small that the cost of throwing it away is minimal. Additionally there is little incentive for small businesses to recycle paper as they are not big enough to be financially penalised by either the Landfill Tax or the Packaging Directive. Collectively the level of waste is disastrous. What is The Laundry doing to help? Environmental group BioRegional launched The Laundry kerbside recycling service in May 2003 with no minimum collection. It is cheaper for small businesses to recycle paper with The Laundry than to throw it away in council waste sacks. The Laundry has expanded over the last year and a half and now covers a large part of central London. The Laundry has an innovative and fresh approach to recycling which even appeals to green cynics. The Laundry estimates that of the companies that recycle, only a third buy back recycled paper. The paper The Laundry collects is turned into EVOLVE recycled paper, and businesses who recycle with The Laundry can buy this back at a reduced rate from local stationers, therefore closing the loop on recycled paper.

Emissions Trading – this is a subject that could take up a whole paper many times the size of this one. It encompasses government and company carbon trading, and many feel it is likely in future to include personal carbon allowances and trading too. The carbon markets grew 3 times over to $30B in 2006 according to the World Bank. Negotiations are underway in Bali over what will qualify for carbon credits in future.

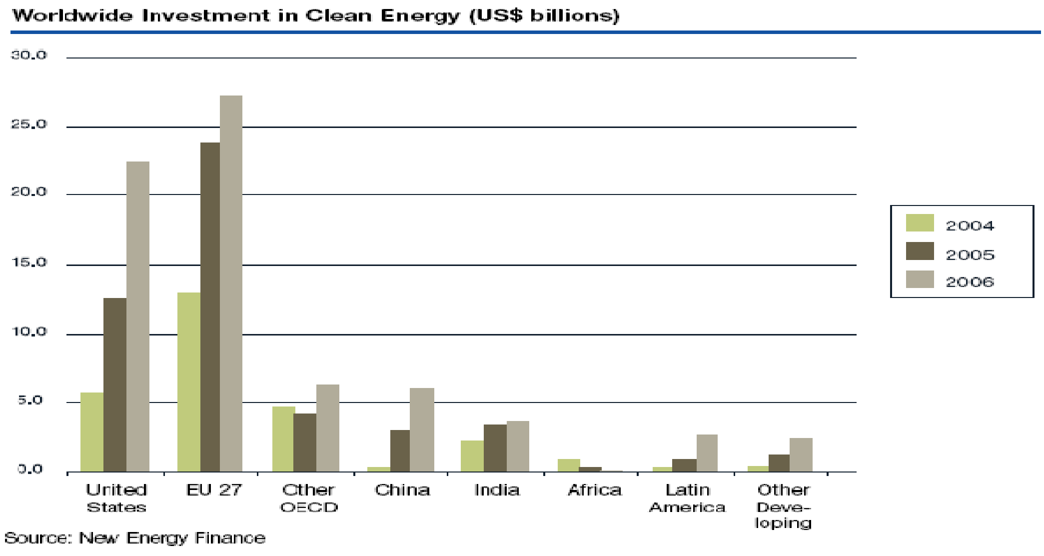
Carbon offsets have clearly also been a hot sector although there are significant doubts which have been raised about both their wisdom (supporting status quo rather than energy efficiency) and also their effectiveness – especially where the voluntary individual's footprint is concerned. Look out for an Ecologist Magazine 5 page special on offsetting from Jules Peck in early 2008 for more on this.

Another scheme worth checking is the **Welsh Purchasing Card**, a system to enable public sector bodies to buy easily from the small business sector against sustainable procurement objectives; opening these contracts for literally billions to small players who traditionally wouldn't trade with government departments, but conversely tying the SME sector into a much more progressive sustainability agenda.

Those are only inklings of what might be possible. But the potential for a shared resource network which did have green AND financial incentives, for instance renting out underused assets, sharing major purchases (what if 100,000 businesses chose to take a line of credit together, or chose to buy a single computer network). The community spirit and approach would be key. What's really being discussed here in some ways is the potential for a co-operative movement 2.0: But with the shared ownership part in a virtual economy founded on helpful, valuable but non-monetary exchanges. Such co-operative schemes are not new of course (for instance the dairy industry has long operated under shared marketing schemes), but they could be pivotal to building a sustainable economy.

The fact that such non standard avenues might be needed to transform the economy, brings us back to the question of investment on how the low carbon economy of the future – or at least the high growth ventures which spur it forward - might best not only be built, but funded….

the funding and investment situation for UK green start-ups



The cleantech funding situation

The global Environmental Goods and Services (EGS) sector was worth $515 billion in 2002 and is forecast to grow by 3% a year to $690 billion by 2010. Most of this is in utility services – waste management and water and wastewater treatment alone account for about 72% of the existing global market. In the UK ESG had an estimated turnover of £25 billion in 2004, employed 400,000 people and had 17,000 companies. Recent estimates suggest that the domestic market is forecast to grow substantially, expanding to £34 billion by 2010 and on to £46 billion by 2015, again dominated by waste and water segments[9].

Cleantech markets will range far wider than the traditional EGS sector. The total global market for fuel cells, solar, wind and biofuels is forecast to grow fourfold from $39.2 billion in 2005 to $167 billion by 2015 and the Stern Review estimated £20-30 billion per annum low carbon investments in just the developing economies.

[9] Clean Capital - Forum For the Future 2006

The VC eco-entrepreneur funding situation

Historically there has been a distinct lack of funding for green start-ups in the UK and indeed Europe. Forum for The Future surveying this scene early in the decade quoted from a business school study: "Insead's research among the mainstream VC industry discovered only about 20 firms around Europe interested in environmental investments. Since the industry has about 850 European players, that is pretty dismal. They reckon green VC accounted for just 0.08% of the total invested in 2000." (An NGO commentator was quoted in that article as saying "There's bugger all going on."). In a Bank of England report on financing social enterprises in 2003, 32% of social enterprises cited lack of available external finance as a barrier to expanding trading activity.

Five years on the situation has clearly been transformed by public, City and government interest in finding urgent solutions to the threats posed by climate change. In just the last 18 months a combination of high oil prices, rising concerns about water and other resources, Chinese and Indian consumption driving commodity prices high, government legislation and incentives and consumer awareness has led to step changes in such investments. Following a survey in late 2005 of VCs and analysts, Red Herring magazine made "more investment in green start-ups" their number one trend prediction for 2006.

The *cleantech* investment trend has taken hold in the US, although many commentators point to things being much slower in Europe. In the US $2.9B was invested in Cleantech in 2006 vs only $700m in Europe. Perhaps more significant to Europe's long term position in industries like solar is the growth of cleantech investment in China (where it now trails only just behind IT and communications at $420m) and is growing at such a rate that it will overtake current European levels in 2008. In industries like solar, the first to scale will be the first to achieve an affordable mass market price point and this winner will take it all.

Recent studies such as that carried out for the EU VC market by New Energy Finance has also shown that VC is delivering often 40-50% returns and this in turn has led to increased interest in VC funding[10].

There are long established specialist players in this space in London such as Low Carbon Accelerator, Impax, Foursome and Bridges Community Ventures. These are now joined in a burgeoning investment scene by heavyweights such as KPCB (who recently teamed up with Al Gore/Generation) and new funds such as Foresight's (raised £15m, predicting £20m end 07) as well as Environmental Technologies Fund, Ludgate, e-synergy and WHEB Ventures. Phoenix has recently made a £7m investment in Abel & Cole. Four Winds and Impax are also often mentioned as being some of the most serious players.

Bemoaning the lack of funding for small and innovative players, NESTA have entered the fray committing £50m of government money over the next 5 years. However, a number of people consulted for this paper were of the view that Government should actually avoid competing with the private sector in setting up its own funding schemes like Energy Savings Trust, Carbon Trust and NESTA.

[10] Source – WHEB Ventures

The space is also characterised by money from wealthy individuals and business leaders such as Branson and Google founder Sergei Brin; and increasingly their corporations following suit with sizeable funds for cleantech investments. Outside cleantech money seems still to be very hard to source for true green ventures; for instance People Tree recently took on £0.5m from Dutch microfinance house Oikocredit (more usually associated with developing world projects). There is a difficulty that many green ventures are too small for venture capital support – the due diligence process and overall cost base means that investments of less than several million are difficult.

The neat match between eco-entrepreneurial business and VC

Sustainability is very much driven by innovation both technology and social innovation. VC by its nature seeks out new innovative investments. VC companies are also growing at a phenomenal rate and usually have a much more direct role on the boards of companies they invest in than investors in stock. That means they can play a much larger role in companies they invest in and therefore a VC fund which aimed to drive sustainability change could have huge impact.

The networking role

There are encouraging developments in the essential networking function between green entrepreneurs, potential investors, the creative industries, big business, universities and so on. This paper and the 10 December 2007 event at which it is launched is hopefully a contribution to this, established connectors such as Green Salon, Social Venture Network and university science park forums are making progress, following the Silicon Valley model that (to paraphrase Hillary Clinton) 'it takes a cluster to raise a sector'.

Feedback to this paper suggests that there can tend to be a level of distrust between 'green' and VC players as – at least initially – they each can assume the others are coming from a very different perspective and indeed philosophy. However evidence also says that common language and trust can be built up and that this can lead to fruitful exchange of thinking and very positive outcomes.

Early stage funding needs

Very early stage seed funding seems to be an area where there is least support in the UK. In the US and particularly Silicon Valley there are a host of such initiatives as well as national US initiatives such as InvestorsCircle and Good Capital which bring angles and budding entrepreneurs together. UnLtd is a UK £100m Millenium Commission funded charity which supports and funds social entrepreneurs with micro-loans at the very early stages of their businesses. Global Social Venture Competition is a similar US based international organisation. Work has also been carried out by the Commission on Unclaimed Assets headed up by Sir Ronald Cohen on a proposed £250m Social Investment Bank which would fund both charities and seed-fund budding for-profit social enterprises.

A new form of more 'patient' capital?

The term Patient Capital is used to describe a longer term investment horizon, which is appropriate for some early stage for profit green ventures. Joel Makower describes patient capital as *"an amorphous but emerging set of business models…rooted in the notion that pursuing maximum growth and maximum shareholder value often dilute a company's social and environmental mission, and that achieving financial, social, and environmental benefits can take time."*

Angel investors and early stage VC investors can be patient in their approach: *"If you look at the investment remit from E Synergy, Foresight Investment Partners and the ETF (Environmental Technologies Fund) and probably Low Carbon Accelerator Fund, then these have a bent towards 'early stage' Venture Capital investment. This tends to be 'patient' capital of five years deployment. Whereas Ludgate Environmental and the others are moved focused on late stage."*

Mark Campanale – London Bridge Ventures

For non profit social enterprises patient capital may also involve "soft" loans or grants or a "blended value" investment approach that combines social returns with lower than market financial returns.

In their 2004 report on equity like capital for social ventures, Bridges Ventures defined patient capital for social enterprises as 'less commercial than equity-like capital, meaning that it does not necessarily require full repayment of the investment…the core tools used in patient capital are grants and low interest loans.'

London as a Centre for Green and Cleantech Investment

Within Europe, 'London is it' was the view of many we interviewed. Some key developments which were highlighted:

- Creation of boutiques such as Carbon Capital Markets; Man Group – Environment Finance group; Sindicatum who has raised a $600 million fund; Climate Change Capital
- The London Climate Change Services Group, funded by Corporation of London and its members that comprise 40-60 investors & traders.
- Black Rock raising $3.5 billion for renewables in London
- $1 billion by Bozena at Allianz for Eco Trends
- The hedge funds such as GLG Partners & Trucost
- Impax is cited as particularly visible
- Clean tech prop desks at Goldman, Credit Suisse?
- Creation of specialist teams for renewables and clean tech at the brokerages eg Citigroup, Hoare Govett, Morgan Stanley, Numis, KBC Peel Hunt

- Private equity funds – ETF, Zouk, Good Energy, Nomura, Foursome, Rab, Black River, Low Carbon Accelerator Fund, Englefield, Aloe Private Equity or Conscensus all of which have hit the road running with capital deployment in the last 2 years.

- Data from New Energy Finance – the main source now cited in the broker reports and newspapers

- Networking – London Stock Exchange clean tech and Environmental Markets days? Companies present to VC's and listed equities fund managers, on water, fuel cell, biomass etc - organized by Carbon International.

next steps

This paper is just the start of a dialogue between investors and green entrepreneurs. It is therefore too early to make any hard and fast recommendations. What is clear though is that both the investor world needs to be able to understand these issues better and more entrepreneurs need to be attracted to develop enterprises in this pace. Perhaps what is need is some forum in which ideas can be exchanged?

The authors do feel able to pose a few questions which might encourage more debate.

Investors and particularly the VC world:

- What is YOUR vision of a low carbon economy? Do you for instance buy the seven wedges model? (reduction through 7 key existing technologies) Or do you share the author's view that more of a paradigm shift is needed?
- If the green equivalent of Google walked in your door next week, would you recognise them? (How do you evaluate radical new models?)
- Are you thinking about the broader ways to achieve sustainable goals by investing in high growth businesses. Do you tend to focus a bit heavily on supply and less on transformation through green consumer demand?
- Do you understand enough the radical changes needed to transform the economy to deal with the challenges outlined in the context section of this report? What role can you profitably play in this transformation?
- If you are not in early stage VC funding of eco-entrepreneurial activities why not?– there are large profits to be made whilst also doing great good.
- Just as we suggest there will be new innovative business models based on sale-of-service, cradle to cradle, open-source etc will there need to be new versions of investment – perhaps a VC2.0 more amenable to these innovative models?
- How can these new ideas reach the kinds of scales that will be required and what are the stumbling blocks?
- Is there a need for more networking and common language between eco-entrepreneurs and investors and if so how? You seem to share many concepts and ideas but use different languages?
- Do you get the green versions of thinking outside the box; for instance product service systems, dematerialisation and so on?
- Is there a need for a specific fund for seed-funding new model start-ups such as the ones detailed above and if so how would this work? Could the proposed Social Investment Bank teach any lessons?

- Is this working better elsewhere – for instance in the US – and if so what can be learnt?
- Could VCs play a more strategic role in identifying potential plays that would deliver greater growth and success than the 'organic' route favoured by many green leaning entrepreneurs?
- If you are a Pension fund or foundation should you examine whether you can direct more of their portfolio allocations to Venture Capital funds with a sustainability bent?
- All investors. Are you using your influence to lobby UK and EU Government to put in place the kinds of radical market incentives needed to push this revolution into hyperdrive?

Eco-entrepreneurs:

- Do you recognise rapid improvements coming to deliver more supportive market frameworks driven by Government and growing markets driven by consumer demands increasing – if not why not?
- Re-examine the cultural resistance to investment and rapid growth; if you are so good, why shouldn't you be bigger?

Mainstream business:

- What is your role in all of this is and how can you support green enterprise in reaching scale?
- Are you part of the problem or the solution? For instance 55% of advertising spend is on cars emitting over 165 gm CO2/km
- Media sector – why are you so far behind leading business in recognising your role to be part of the solution not the problem in things like carbon literacy?
- Is there a potential for a Private Equity style play which buys businesses in order to give them a massive sustainability (and hence future viability) makeover?
- Are you using your influence to lobby UK and EU Government to put in place the kinds of radical market incentives needed to push this revolution into hyperdrive?

Government:

- What role policy and incentives can play in directing more funding to these types of enterprises?[11]
- Have you seen the urgent need to set in place a radical landscape of incentives and regulations which drive the UK economy towards a zero-carbon, zero waste status fast?[12]

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[11] See for example Venture Capital for Sustainability 2007 - Eurosif

[12] See for example www.qualityoflifechallenge.com

- Will you ensure that all public procurement demands the very highest social and environmental standards thus driving market changes in demand for such goods and services?
- Are you going for green votes – being brave and showing leadership?

conclusion

This paper has been written to start a conversation. The authors hope that it has done so. Hopefully this is just the beginning of something ongoing in which investors and potential and current eco-entrepreneurs in the cleantech and 'beyond cleantech' sector can collectively help find solutions to the issues raised.

The Carbon Positive Company

The Carbon Positive Company is a new consulting venture, launching 2008, combining the talents and experience of John Grant (former St Luke's co-founder, new marketing guru and author of 4 books, including The Green Marketing Manifesto, Oct 07) and Jules Peck (ex WWF, director Conservative Quality of Life Challenge, author of influential reports on sustainability and future government policy, marketing and the media). Why carbon positive? Because the focus is on breakthrough green innovation and new ventures.

John can be contacted on **+44 7799 367573**
thejohngrant@btinternet.com

Jules can be contacted on **+44 7920 844802**
julespeck@qualityoflifechallenge.com

This document will now be posted at **www.theglasshouse.net** and the authors hope to continue a dialogue with those who have taken their time to read this.

Founded in London in 1998, The Glasshouse exists to provide support, encouragement and inspiration to entrepreneurs across all sectors. The Glasshouse has held its unique style of invite only events in London, New York, San Francisco and Prague.

The events are designed as a catalyst for discussion and debate amongst the most innovative participants in business and entrepreneurship, the arts, politics, media, education and the public sector in each of our host cities. The Glasshouse values diversity of thought, business, and background. Most of all, the common aim is to encourage, stimulate, and promote those with an entrepreneurial passion who want to shape their own future. Recent speakers include: Jimmy Wales, founder of Wikipedia and Wikia, Michael Birch, Founder of Bebo, Martin Stiksel and Felix Miller, co-founders of Last.fm.

Best known in London for their highly successful Second Chance Tuesday events for entrepreneurs and investors in the technology, media and telecoms sectors, the Glasshouse team have now launched a series of Green Shoots events for entrepreneurs, investors and industry thought leaders in the sustainable economy.

"Glasshouse events bring style and wit for the entrepreneurial set.
You can't chuck a brick without hitting a mogul or a maven"

Jim Buckmaster – CEO, craigslist

Contact **Judith Clegg**, Founder of The Glasshouse on **+44 (0)20 7520 9203**
judith@theglasshouse.net

www.theglasshouse.net