Chapter 23

Going Green has to be Fair

Chris Huhne

Climate change is not an ordinary political issue. It is beset by collective-action problems, in which individuals acting in their self-interest condemn us collectively to a bad outcome for everyone. It involves huge sums of money. Debates are riddled with misinformation, often put out by or funded by groups with an interest in the status quo. There are virtually no solutions that some vociferous section of the country does not hate.

However, climate change is also set apart by its ticking clock. We are dangerously close to the 2°C point of no return, beyond which there is little humankind can do to prevent further temperature rises or stabilise global weather patterns. Yet the process of changing the energy infrastructure is tantalisingly slow, because so much capital has been committed to high energy demand and fossil fuel use. Rising energy costs have lashed disposable incomes for more than a decade, pushing many families into fuel poverty, and worsening an already brutal economic downturn. Yet in spite of the urgency, the process of building public support is painfully slow. Maslow's hierarchy of needs switches in during a period of squeezed living standards, focusing politics on the raw and short-term issue of family budgets. The sceptics argue that the poor cannot afford greenery.

If measures to attack climate change are to be sustained in the UK, this argument has to be tackled on two levels. The first is the evidence that climate policies promote growth, jobs and living standards. That set of issues is addressed elsewhere in this volume. The second level is that climate policies are fair. This is not just about fairness to future generations, but also fairness in the way that solutions are implemented today. At the very least, green policies must not worsen the distribution of income. They might even aim to improve it. Liberal Democrats, after all, believe in greater equality of outcomes, not just equality of opportunity. Even equality of opportunity is meaningless if a child's circumstances curtail its life chances.

Overall, climate change policies have to meet this equity test. Green efforts that hit poorer families and create real social injustices will not be

seen as fair or legitimate, and they will gradually erode the coalition in favour of change. Some green enthusiasts are blind to the potential impact of some measures (such as a high carbon tax) on the poorest in society, yet this would fracture the key progressive cross-party coalition in favour of change and call into question our commitment to greater equality. This chapter is, in essence, about why the environmental agenda must complement the social agenda, and how to go about it.

Shelter from the storm

A little over a decade ago, the Labour government set out to abolish fuel poverty. At that time, when oil prices were US$10–15 a barrel, and disposable incomes were growing steadily year on year, more than 2 million UK households were still 'fuel poor': they had gas or electricity bills that swallowed more than a tenth of their income.[1] The government set itself a deadline of 2016 to wipe out this kind of hardship, launching new income-related benefits and a nationwide home improvement scheme to get demand for energy down and reduce the toll on disposable incomes.

It has not gone well. Huge sums were invested in the Winter Fuel Allowance and Warm Front, and yet the numbers of fuel-poor have gone up. They are on course to hit 8 million by 2016.[2]

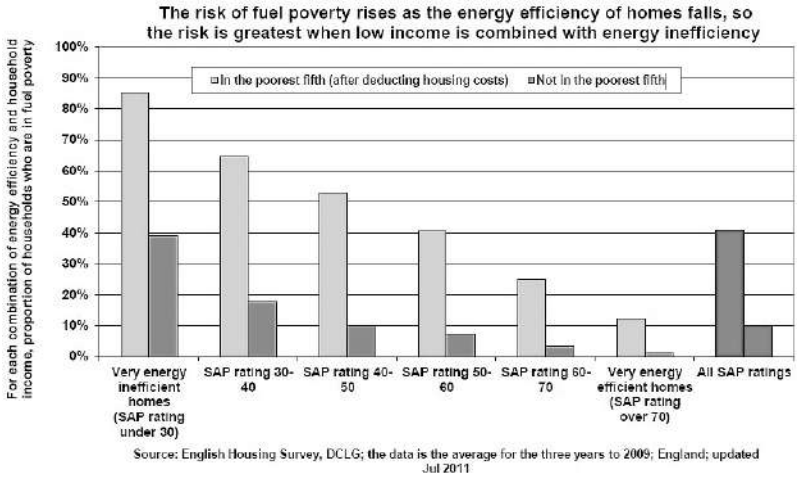
The first problem is that energy prices have been bounding upwards for more than a decade, pulling more and more families into fuel poverty. Gas is the key fuel for domestic heating, but non-US gas prices still move with the oil price (and in some cases are explicitly linked to oil prices). Within eight years, an oil price of US$10 a barrel was replaced by one of US$147. The average gas bill in the UK doubled.[3]

The government's policy response was too slow and too untargeted. Part of the problem is the definition of the measure of fuel poverty, as John Hills' recent excellent review pointed out. When Her Majesty the Queen flirts with fuel poverty because her palace's furnaces burn nearly a tenth of her income, there is something wrong with the targeted definition. Hills rightly proposes that people should be considered fuel-poor if they have relatively high required fuel costs to maintain reasonable heating levels, and if they would be left below the official poverty line if they were to spend that amount. In addition, the government should concentrate hardest on those most in need. It should adopt a new indicator of the depth of fuel poverty – a 'fuel poverty gap' – which is the amount by which the energy needs of fuel-poor households exceed the threshold for reasonable costs. This government – any government – should set sensible targets for things it can actually affect.

There were other problems with the last government's efforts. The Warm Front scheme involved upgrading boilers for free, but the costs were often loaded up by the contractors so that the scheme was more expensive than it should have been, and householders sometimes had to top up the generous subsidies. More broadly, the government continues to support the costly Winter Fuel Allowance (at around £2 billion – £3 billion a year), handing payments to virtually all over-sixty-one-year-olds regardless of the efficiency of their home or even where they live; more than 60,000 British pensioners who are lucky enough to have retired to the Costa del Sol and other Mediterranean climes benefit as well.[4] Just 41 per cent is actually spent on heating (and some estimates put this much lower).[5]

However, the real enemy – both on costs and emissions – is leaky homes. Under-insulated, single-glazed, cavity-wall-less houses are the reason why fuel poverty stays stubbornly high, and indeed rose with the rise in fossil fuel prices. At the end of the 2000s, when fossil fuel prices were at their very highest, it was still efficiency rates that made the difference. Among the poorest fifth of the population, almost 90 per cent of those in very inefficient homes (with a Standard Assessment Procedure (SAP) rating of less than 30) were living in fuel poverty. For those in very efficient homes, in the same income group, just 10 per cent were fuel-poor.[6] Perhaps more intriguingly, only 40 per cent of those in fuel poverty are among the poorest 20 per cent by income. While there is obviously some overlap, nearly a quarter of the fuel-poor are found in the second-to-bottom income bracket.

Fig 23.1 Fuel poverty and energy efficiency ratings[7]



What is going on? In the post-war housing boom of the 1950s and 1960s, Britain built more than one in five of the homes standing today.[8] It was an amazing chance to design out fuel poverty, minimise fossil fuel use, and shore up the economy against energy shocks. We missed it. Houses were built at a tremendous pace, but mostly with lousy standards of efficiency, scarcely better than the older vintages of housing on which we also still rely. The typical British home is too cold in winter and too hot in summer.

Even though the continent tends to face much fiercer winters, other Europeans do not have anything like the UK's rate of fuel poverty. The Swedish winter is on average 7.24°C colder and lasts two to three months longer,[9] but at one point in recent years they actually used less energy for heating per dwelling.[10] This is mostly because the Swedes have already had their energy efficiency revolution; after the oil shocks of the 1970s, they made impressive efforts to conserve energy and switch away from high-carbon, reducing the use of fossil fuels and increasing renewables.

The second story is rather brighter. One of the big reasons why more low-income families have not tipped into fuel poverty is that social housing has been properly renovated. Some 92 per cent of social housing now meets the 'Decent Homes' standard for warmth,[11] and average SAP ratings for energy efficiency have jumped from 47 to 63 since 1996 – not a long way from the 'very efficient' marker of 70 plus.[12]

Not too surprisingly, the private rental sector is doing worse. Some 40 per cent of dwellings were built before 1919,[13] and 44 per cent are deemed 'not decent'.[14] It is the sector least likely to be upping efficiency, has an average SAP rank of 53,[15] and yet is growing rapidly because of increasingly unaffordable house prices.[16] And it is not well-suited to home improvements. Renters need permission to make any alterations – especially major retrofits – and since landlords don't usually pay the bills, they don't have much incentive to reduce them. Many people in rented houses do not plan to stay very long, so even loft insulation that pays for itself in less than a year does not get done; almost 40 per cent of all private renters leave after less than a year, and almost 60 per cent leave after fewer than two.[17]

The effects of all this are all too real. Low-grade homes are a serious economic drag, and they do terrible harm to the health and welfare of their occupants. In the midst of the worst cold snaps, some poorer elderly citizens find that they have to choose between eating and heating.[18] Energy use among the lowest income bracket can vary wildly, with the heaviest users consuming six times that of the lightest.[19] As the Hills Review of fuel poverty shows, a troubling number of low-income households are

'significantly under-consuming relative to need'.[20] In the colder regions of the UK, residents in poor housing are 45 per cent more likely to have high blood pressure,[21] and as many as 24,000 people are thought to die needlessly each winter from the cold.[22] The economic toll is fairly severe too. The Department of Health estimates that winter-related disease from cold private housing costs the NHS nearly £1 billion a year.[23]

The problems with price signals

This is all rather troublesome for some green propositions. So long as such a vast efficiency gap stretches between one dwelling and another, imaginative ideas that rely on people reducing their energy use are not going to work. The inefficient simply cannot get their usage down: they are locked into consumption that they often cannot control.

The theory of the carbon tax is marvellous. Put up the price of carbon – of coal, oil and gas – to capture the full extent of the damage that it inflicts on the environment, and the market economy will do the rest. Higher prices for carbon will curb demand, and encourage alternative low-carbon supply; and price signals will ensure that people tend to find the cheapest and therefore most economical way of dealing with the problem. A full-scale tax on the carbon cost of every transaction could be truly transformational, but it is also hugely risky.

For one thing, there are very real differences in need that cannot be lessened just by tweaking behaviour. Most senior citizens and many disabled people, for example, are going to be at home most of the time, in a room temperature several degrees higher than average. And as we saw above, low-income households often live in the worst-insulated homes that need to improve their energy efficiency just to get comfortable. They can't reasonably be expected to actually reduce energy consumption. The environmental justice of a 'polluter pays' response could provoke a gross social injustice, especially for those least able to pay.

Carbon taxing also rests on the premise that bill payers act rationally – and, for the most part, conventional economics is probably right to suggest that they do. Make it simple to choose cheaper providers, efficiency measures or renewable generators, and take-up will soar. But there are exceptions, and they tend to be among the most vulnerable. The green charity Groundwork, which installs free energy-efficiency measures for poor households, disabled people, and the elderly, find that around a third do not know what energy efficiency is, refuse to believe that it saves money, and are unlikely to trust retailers unless the council authenticates them.[24] Elderly people very rarely

switch energy supplier and can be wary of big changes to their living situation, even those scraping by on a low income.[25] Plenty of elderly home-owners would benefit greatly from an equity release scheme to pay for energy efficiency improvements, since a good many are income-poor but asset-rich, but in reality many are very reluctant to do it. Realistically, this sort of problem has to be addressed before a full-scale carbon tax could go ahead.

For the progressive case behind green energy to hold, it is essential for the state to play its role as the navigator of the 'information problem', directing people to markets, simplifying decision-making, and providing guarantees and reassurance to consumers. The number of people in the UK who change energy supplier each year hovers around a lowly one in five.[26] As energy prices spiked in 2011, switching actually fell to fewer than one in seven. Fully 64 per cent of householders have never switched.[27]

The poorest households take the biggest hit on energy, and yet are likely to overspend the most – by around £250 a year on some estimates.[28] On average, those on pre-payment meters pay an extra £125 a year. One analysis suggests that fuel poverty (on the old definition) would fall by 15 per cent if the lowest third of earners switched to the lowest tariffs.[29] Just as weights and measures legislation in the late nineteenth century allowed us to grumble over the price of beer, and go elsewhere agitating for a better deal, so electricity market reform has begun the much delayed process of simplifying energy choices. But there is some way to go on building a culture of choice on energy, or efficiency products, or domestic renewables. Unless the way in which we choose energy is completely rewired, cheaper, cleaner supply will continue to elude us.[30]

This is where there is a potential conflict between green and equity objectives which requires care to navigate. Abolishing fuel poverty is going to cost a lot[31] and cannot realistically be achieved through 'hands-off' market measures like the full carbon tax. Targeted measures are needed to deal with specific problems.

The Government's Energy Company Obligation (ECO) has brought one stream of outside support which will supplement the Green Deal by about £1.3 billion a year; it will fund those who currently under-consume energy, where energy saving improvements tend to lead to more comfort and, consequentially, no saving in energy. It will also fund old houses that were built before the widespread use of cavity walls, and where insulation to the solid walls has to be applied internally or externally as cladding.

The amount allocated to ECO should be larger, not just on energy-saving and equity grounds but also because this is a particularly effective job-creating tool where a small amount of government funding releases a multiple of

private spending. For example, a solid wall home may attract ECO subsidy, but the associated measures of draught-proofing, balloons in chimneys and so on, will all pay for themselves under Green Deal finance.

Transport

We have discussed the conflict between green and redistributive objectives when it comes to energy use in the home, and the problems that can be caused both by differing needs and by different levels of energy efficiency. There are also problems when we look at green objectives for transport, although arguably there are less acute side-effects for redistribution.

At the time of writing a litre of petrol costs £1.32. That was composed of 58p in fuel duty and 22p in VAT, leaving 52p for the actual fuel.[32] In the United States, the federal gas tax is just 18.4 cents a gallon.[33] The Treasury does not now classify fuel duty as an environmental tax, it falls under 'revenue-raising' – and it hauls in a little under £30 billion a year.[34] This has made it all too easy for the anti-green right-wing to claim progressive colours, and say that taxes on driving are a tax on the poor. There are plenty on the left who sympathise, worrying that fuel duty has become a closet flat tax. After all, rich and poor pay exactly the same levy with no consideration of ability to pay.

In rural areas, it is indeed true that virtually everyone needs a car, because bus and train services are so poor. But this is a problem for a minority, and there are other means of tackling it (like specially reduced rates of duty on petrol in remote rural areas). Taking the country as a whole, the poorest households often do without a car. Overall, 20 per cent of households have no access to a vehicle.[35] Half of low-income households (the bottom 20 per cent) do not have access to a vehicle, and for the average family in the bottom 10 per cent, transport takes up less than 9 per cent of weekly spending.[36] Most of the poorest use public transport. In principle, therefore, the use of price signals – green taxes on motoring – is a way of shifting behaviour, providing that some of the rural side-effects can be offset with lower fuel taxes or vouchers.

There are also strong reasons for doing so which do not just involve carbon emissions. Traffic is expected to rise by 44 per cent by 2025,[37] and already cars are responsible for 3,300 premature deaths every year – more than the numbers killed on the road – at an estimated cost of £6 billion, particularly thanks to the respiratory consequences of pollution.[38] London's roads regularly breach nitrogen dioxide pollution limits.[39] Overall, air pollution in the UK is thought to kill 29,000 each year.[40]

Partly because of the ratcheting up of fuel duty that began under Ken Clarke's chancellorship, the demand for rail travel has been soaring. Even

though rail journeys are still very expensive in Britain compared with the Continent, Britain's railways are carrying more passengers than at any time since the 1940s, before Dr Beeching's cuts to the extent of the national network.

Tackling the problem: Green Deal

At this point, it is worth summarising the argument. There is indeed a potential conflict between green objectives and the objective of equality if simple solutions such as a carbon tax are relied upon. We have seen that consumer short-sightedness, differing needs, lack of access to capital, and the sunk capital in the housing stock all have their effects. Our homes are too draughty, our cars too dirty, our knowledge too patchy, and our investments too scary. Yet we ought not be discouraged. These are all solvable problems even if they will tend to complicate policy.

There have always been two problems with energy efficiency improvements. The first is that the cost has to be met upfront, which puts off some people who will nevertheless benefit. The second is that landlords of rental property have no incentive to improve given that the tenant reaps the benefit, while tenants have no interest in improving a property which is not theirs. Both of these issues are addressed by a 'pay as you save' scheme like Green Deal, which therefore creates the conditions for a sharp improvement in energy saving.

Under Green Deal, energy-saving measures are installed for free, and you pay back the cost out of the savings made on your bill. The scheme is designed so that savings always outweigh repayments; your bill will always be lower. The payments, moreover, are attached to the energy bill, so that it does not matter if the tenant moves; the cost will continue to be deducted from the electricity bill linked to the property until the repayments are complete.

The Green Deal scheme also avoids the problem of Warm Front locking in privileged suppliers: any householder can take their survey and get a competing quote. Competition will keep suppliers honest, and ensure that any subsidy goes to improving homes rather than suppliers' profit margins.

In a rational world, Green Deal should take off on its own, as its benefits outweigh its costs; householders should save money immediately by installing Green Deal measures. However, there is a long history of consumers failing to take up such measures, perhaps because of worries like clearing the attic, having the builders and their dirt in the house, or – as we saw above – not believing that the activity is worthwhile.

That is why it is crucial for the government to provide information, incentives and, where necessary, regulation to support the scheme. Already,

private landlords will be required to undertake Green Deal by 2018 if their properties are F or G rated in their Energy Performance Certificate, affecting more than 600,000 of the least energy-efficient properties. This was not regarded as a regulatory burden because there is no cost to landlords, and indeed there may be a benefit if they are able to charge higher rents. There will certainly be a benefit to tenants who pay lower bills.

If Green Deal is to reach its full potential, however, the government will have to be much braver about driving demand, particularly among owner-occupiers, still the largest sector with the greatest number of leaky homes. The obvious solution is to make it particularly attractive to install Green Deal when a property changes hands, as this is the point at which most owner-occupiers repair, improve and decorate their property. Since the builders are going to be coming in anyway, it makes sense to get Green Deal done as well.

Two incentives would help. The first would be to require any buyer of a home without Green Deal to ask for a survey, and install the measures within a year, unless they specifically opted out of doing so. Such an arrangement is already being adopted by the government for private pensions, and there is no reason why it should not be extended. It would make sense to add an incentive: those who continue to opt in should benefit from a lower rate of stamp duty on the purchase price than those who decide to opt out.

Let us turn now to some of the potential impact on economic activity. The UK already has close to a million green-collar workers,[41] and Green Deal is estimated to add a further 39,000–60,000 in insulating jobs by 2015.[42] If Green Deal is pushed with regulation and tax incentives, it would be relatively easy to increase the employment impact sharply – possibly to 100,000 or more over a similar timeframe.

Green Deal jobs are created wherever there is old housing stock, which is pretty equally spread across the country in proportion to the population. Most other government measures tend to have much more localised employment impacts, depending largely on where the investment is required or where it can be built: an aircraft carrier in Rosyth, a motorway in the West Midlands and so on. Because Green Deal boosts construction, it is also particularly beneficial in absorbing young men who are often hard to employ, and it gives them important and useful skills.

A greener economy will go on creating jobs, stirring innovation, and raising incomes after the first wave of Green Deal improvements. Many of the early-stage technologies discussed here will quickly be eclipsed. The accelerating pace of cost reduction in solar panels is one example. Another is the improvement in lithium-ion vehicle batteries, extending range and cutting

costs. The first low-energy lightbulbs, compact fluorescents, have now been bested by LEDs. The former uses 20 per cent of the electricity used by traditional incandescent bulbs,[43] but LEDs take a further leap, using just 10 per cent for the same amount of light.[44]

The green tax switch

We have already discussed the problems of a carbon tax, but there are green taxes which, if combined with tax cuts elsewhere, can have a progressive impact on the income distribution. Fuel duty tends to be progressive, because richer people tend to drive bigger cars, and poor people drive no cars at all (with the exception of rural areas, already noted, for which there are other solutions). There could also be a much more radical reform of car sales tax and Vehicle Excise Duty, with sharply graduated taxes according to the carbon emissions of vehicles, as I have argued elsewhere.[45] Air transport duties are also progressive, as only 32 per cent of leisure flights from UK airports are taken by the bottom two socio-economic groups.[46] The average income of those taking leisure flights is nearly £49,500, almost double the national average.[47] Revenue from such green taxes can be used to bolster low and middle incomes through rising personal allowances or even rising tax credits (which are in turn removed from the better-off).

The green tax switch, though, must be seen to involve tax cuts that offset the tax increases, or the public support for any such measures will dwindle. Voters are understandably suspicious of finance ministers who impose green taxes, thinking that this is just another revenue-raising gambit. However, a clear and transparent offsetting tax reduction can be popular, as the Scandinavians have proved. This is what the Swedish did with their green taxes in the 1990s. In France in 2009, voters were polled on whether they would back a carbon tax, with 74 per cent saying no; but when asked whether they would back one that is fiscally neutral for households, a majority said yes.[48]

The move to a low-carbon economy will be one of the dominating themes of the next few decades, and there is an understandable temptation in some parts of the green movement to look impatiently for simple and attractive solutions which will deliver major change. Hence the carbon tax, or the personal carbon allowance. However, these could have very dramatic adverse effects on equality, and could undermine the progressive political consensus in favour of a transition to a low-carbon world. It is crucial that policies are not just effective, but fair. It is therefore essential that there are targeted measures – such as Green Deal, supported by ECO, a green tax switch to low-income families, and support for low-carbon public transport – to tackle

those difficulties. They must be bolstered by regulatory and other incentives. Decarbonisation policy will inevitably be complex, but the total package must be fair if radicals are to meet our objectives and public support is to be sustained.

Notes

1 DECC, *Fuel Poverty Statistics*, July 2012.
2 John Hills, *Getting The Measure of Fuel Poverty: Final Report of the Fuel Poverty Review* (Centre for Analysis of Social Exclusion, LSE, March 2012).
3 John Hills, *Fuel Poverty, The Problem and its Measurement, Interim Report of the Fuel Poverty Review* (Centre for Analysis of Social Exclusion, LSE, October 2011).
4 DWP, *Benefit Expenditure Tables*, 2012.
5 IFS, *Cash by any other name? Evidence on labelling from the UK Winter Fuel Payment* (May 2011).
6 Joseph Rowntree Foundation, *The Poverty Site: Fuel Poverty, 2011.*
7 Ibid.
8 DCLG, *English Housing Survey: Household Report 2010–11* (February 2012).
9 UK Meteorological Office, 2012; Sweden Meteorological Service, 2012.
10 ODYSSEE, *Consumption per dwelling for space heating* (2005).
11 Homes and Communities Agency, *Existing Housing Stock* (2012).
12 DCLG, *English Housing Survey* (2012).
13 DCLG, *English Housing Survey* (2010).
14 ONS, *Housing* (2011).
15 DCLG, *English Housing Survey* (2012).
16 IFS, *The spending patterns and inflation experience of low-income households over the past decade* (June 2011).
17 ONS, *Housing.*
18 IFS, *Is there a heat or eat trade-off in the UK?* (2011).
19 Ekins and Dresner, *Improving UK home energy efficiency without negative social impacts* (2006).
20 Hills, *Getting The Measure of Fuel Poverty.*
21 Imperial College London, *Elevated risk of high blood pressure: climate and the inverse housing law* (2002).
22 ONS, *Excess winter mortality in England and Wales* (2012).
23 Department of Health, *Cold Weather Plan for England – Making the Case: Why cold weather planning is essential to health and well-being* (November 2011).
24 Groundwork, *Leeds Green Doctor: Qualitative Survey* (2012).
25 Hills, *Fuel Poverty, The Problem and its Measurement.*
26 Ofgem, *The Retail Market Review – Findings and initial proposals* (2012).
27 Ipsos MORI, *Customer Engagement with the Energy Market – Tracking Survey* (2012).

28 Save the Children, *The UK Poverty Rip-Off: The poverty premium* (2010).
29 Hills, *Fuel Poverty, The Problem and its Measurement.*
30 Tim Leunig, 'People Power – How to Transform UK Energy', *Financial Times*, 9 September 2012.
31 IPPR and NEA, *The Long Cold Winter: Beating fuel poverty* (2010).
32 DECC, *Oil and Petroleum Product Price Statistics: Weekly fuel prices* (14 January 2013).
33 American Petroleum Institute, *Gasoline Taxes* (January 2013).
34 Department for Transport, *Transport Statistics Great Britain* (2011).
35 Joseph Rowntree Foundation, *The Poverty Site: UK Ability to Travel* (2012).
36 ONS, *Living Costs and Food Survey* (November 2011).
37 RAC Foundation, 'RACF backs Work Wise' (May 2012).
38 Steve H. L. Yim and Steven R. H. Barrett, *Public Health Impacts of Combustion Emissions in the United Kingdom* (2012).
39 Defra, *Air Quality* (2012); King's College London, *London Air* (2012); Environmental Research Group, King's College London, *Air Quality in London – briefing note to GLA Environment and Health Committee* (July 2012).
40 Committee on the Medical Effects of Air Pollutants, *The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom* (2009).
41 BIS, *Low Carbon and Environmental Goods and Services (LCEGS) Report for 2010/11* (July 2012).
42 DECC, *Final Stage Impact Assessment for the Green Deal and Energy Company Obligation* (2012).
43 Energy Saving Trust, *Lighting Products* (2012).
44 Energy Saving Trust, *Lit up: an LED lighting field trial* (2011).
45 IPPR, *Beyond Liberty: Is the Future of Liberalism Progressive?* (2007).
46 Civil Aviation Authority, *Trends in UK air passenger traffic* (2011).
47 Civil Aviation Authority, *Passenger Survey Report* (2011).
48 'France's Carbon Tax: Taming the Carbonivores', *The Economist*, September 2009.

Chapter 24

Planning for Sustainability and Green Growth

Paul Burall and Kate Parminter

England's planning system has always been controversial. Some have attacked it as an unnecessary obstacle to business and economic development. Others believe that it gives insufficient regard to protecting heritage and the natural environment. Local politicians and their communities often portray the system as being too top-down, with targets and policies dictated by central government. House-builders, farmers, energy providers and many others see the system as a bureaucratic nightmare that inhibits their ability to provide the services, goods and wealth that the nation needs.

The 2011 *British Social Attitudes* report illustrates the challenge for anyone expecting the planning system to be popular. For example, while 80 per cent of people believed that new homes are needed, 45 per cent opposed any new development near them, with opposition strongest in south-east England and other areas where property is in the shortest supply.

Any decision about development is in practice likely to require compromise, and the balance of such compromises will inevitably be influenced by the priorities of those making decisions about planning policy and its implementation.

Planning should be about meeting current needs without compromising the future. That means ensuring the quality of life of people in the long term, securing sustainable economic prosperity, and safeguarding the sustainability of the environment. Sacrificing these objectives in a quick-fix attempt to secure short-term economic growth can create problems requiring expensive correction in the future, as well as risking the destruction of valued landscapes and biodiversity. Planning, of course, has a role in job and wealth creation but this should not override other considerations, not least because good planning can help to reduce business costs and enhance opportunities for growth.

The ideal planning system should give everyone affected the opportunity to be involved, operate efficiently and not demand more time or cost than is essential, consider all significant impacts and options, be transparent so that

everyone can follow the logic of decisions, and ensure that decisions support declared long-term objectives.

As for planning outcomes, the 2005 *Planning Policy Statement 1* set the objective as facilitating and promoting sustainable and inclusive patterns of development by:

- Making suitable land available for development, in line with economic, social and environmental objectives to improve people's quality of life;
- Contributing to sustainable economic development;
- Protecting and enhancing the natural and historic environment, the quality and character of the countryside, and existing communities;
- Ensuring high-quality development through good and inclusive design, and the efficient use of resources; and,
- Ensuring that development supports existing communities and contributes to the creation of safe, sustainable, liveable and mixed communities with good access to jobs and key services for all members of the community.

The National Planning Policy Framework

So how does the coalition government's National Planning Policy Framework measure up against these criteria? After a hard-fought battle against Treasury rhetoric claiming that planning was damaging its pro-growth agenda, victory was won by those, like Liberal Democrats, who believe that planning can and must arbitrate the competing interests over land use whilst creating economic prosperity, meeting the needs of all sectors of society and protecting our environment and its resources to provide a pathway to a low-carbon future. We especially welcome the inclusion of:

- A clearer definition of sustainable development;
- Democratic local plans as the fundamental building block of the planning system;
- Priority for using previously developed land before greenfield sites;
- Recognition of the value of the intrinsic character and beauty of the countryside;
- Explicitly making planning authorities responsible for taking account of the Climate Change Act and the target of an 80 per cent emissions cut by 2050.

But the way in which the NPPF will work in practice is still unclear. So we need close monitoring of its results, and a review of the impact of the NPPF in 2014.

The NPPF embraces genuine community engagement in decisions that shape their lives and their environment – a fundamental tenet of Liberal

Democrat beliefs. But making community involvement meaningful is not easy. We are therefore disappointed that the Localism Act failed to bring in a community right of appeal. While the Act ensures that local communities have the right to be consulted prior to the submission of some planning applications, the public – unlike developers – still does not have the right to appeal against applications which are contrary to the Local Plan or in which the local authority has an interest. It is therefore crucial that engagement by the local community in pre-application scrutiny is meaningful.

Involving the public

Large-scale developments often excite controversy, but they can offer the opportunity for local people to be genuinely engaged in shaping their local environment. One example is the Chichester Community Development Trust. This aims to help existing residents in the Graylingwell Park development – the UK's largest zero-carbon development – to inform the master planning of new homes and the services, open spaces and infrastructure; it will own and be responsible for any new community facilities as well as the large open green spaces, thus fostering a sense of community. Originally funded with pump-priming from a section 106 agreement between the developer and the planning authority, the Trust will become financially sustainable through a combination of income from assets, a resident levy and user charges.[1]

The neighbourhood planning concept introduced in the Localism Act is welcome; it gives people the power to develop a shared vision for their neighbourhood and deliver the sustainable development they need. The challenge is for local authorities to support a significant number of Neighbourhood Plans at any one time and to be able to provide not only the planning skills of a trained planning officer but also the community development skills necessary to ensure community engagement which is socially equitable. All local authorities should commit to providing such support for a reasonable number of plans.

There are already good examples of community engagement achieved by local authorities. For example, Liberal Democrat-controlled Bristol City Council has developed a unique Neighbourhood Planning Network. This supports, coordinates and promotes the work of around forty-five specific neighbourhood planning groups across the city and has resulted in several plans being supported by the City Council, initiated a rigorous process for pre-application engagement on applications above a specified (quite small) size, and enhanced engagement in the City Council's strategic planning.

Valuing open spaces

Neighbourhood planning reflects the fact that the quality of the local environment has a direct impact on people's lives. Living among attractive parks, gardens and streets and with access to unspoilt countryside does not merely lift the spirits, it has been shown to enhance health and well-being.[2] So the implementation of a key Liberal Democrat policy in the Localism Act that will allow the protection of allotments, playing fields and other green spaces of particular value to the health and well-being of local people is a move in the right direction. But there can be tensions between public access and enjoyment of open spaces and enhancing biodiversity and wildlife. An example where this has been sensitively managed is Cambourne, where the Wildlife Trust entered into a formal agreement in 1997 to manage 80 hectares of green space in a village where housing takes up 133 hectares. Residents now say that it is the ecology which is one of the best things about this new settlement in the East of England. The site is now far more biodiverse and Cambourne is especially attractive to young couples, leading to the village having the highest birth rate in Europe. Three things critical to the success of Cambourne – and indeed any similar future schemes – are a clear management plan at the outset of the development, the necessary funding to deliver that plan, and constant community engagement.

Food systems planning

Urban green spaces are also important as places to provide food, and in doing so often create opportunities for social cohesion. Liberal Democrats have a strong record in this area. Bristol, for example, is at the forefront of bringing a revolutionary concept of food systems planning, aiming to build a food culture for the city that has the health of people and the planet at its heart. The City Council and the local NHS commissioned research to gather baseline information about all aspects of the food on Bristol plates. The resulting report contained a wealth of facts, figures and case studies relating to production, processing, distribution, catering, retail, community food growing and waste.[3] This led to the setting up of an Advisory Food Policy Council with the aim of driving change and plugging food considerations into all areas of planning the city's future. The Council is now drawing up plans to make Bristol a city where eating and celebrating healthy and sustainably produced food becomes something that everyone is proud to be part of, land for food production is safeguarded, urban food production and distribution increases and key infrastructure for local food supply and the diversity of food retailing is safeguarded. It is a means to

help build a green economy with food at its heart and build a mutually supportive relationship between the city and its hinterland, where a significant – and potentially increasing – amount of the food eaten is grown. It enables the development of 'productive green infrastructure', where green spaces have multiple benefits and can function as 'green corridors' linking the city with its rural surroundings.

Liberal Democrats want to see every council adopting a food policy and use a food systems planning process to help deliver it. But it doesn't just have to be in cities. In Todmorden, a Pennines town, an amazing project to involve local people in shaping their own environment and developing social cohesion has taken root. Literally. The 'Incredible Edible Todmorden' project aims to make the town self-sufficient in food by 2018 and to do so by improving the town environment through community action. Starting off with growing in raised beds around the town, it now includes growing plots at community service buildings, surgeries, the fire station and the police station. Many of the beds are adopted by local groups who do much of the planting and maintenance, although some in the town centre are cared for by an organising group. In three years over a thousand fruit trees have been planted and people can just help themselves to the produce. Local eggs and honey have now joined the fruit and vegetables and there are plans to expand the local food range to include fish.[4] Local and national government should look to this experience and implement similar approaches wherever practical.

Enhancing the natural environment

While these initiatives play an important role in promoting biodiversity and enhancing the environment, there is much more that the planning system needs to do, not least because the natural environment is crucial to the long-term health of the economy, from the pollination of crops to the treatment of waste. The loss of habitats and species reduces our options for the future, and we wholly support the government's commitment in the Natural Environment White Paper for a national green accounting system that puts a value on environmental assets as much as on economic output and their creation of the Natural Capital Committee to advise government on the state of natural capital in England.

But we need to go further. Currently, the planning system relies too much on mitigating the damage that development may have on environmental resources. We need to move instead to a system of identifying sites where the environmental capacity is sufficient to absorb development without too much damage. The factors involved in assessing environmental capacity are

complex, and there is an urgent need for a national research programme to set guidance on environmental limits and then to initiate the necessary research to provide information at a local level so that policies affecting the natural environment can take full account of their environmental impacts.

In the mean time, there are some significant improvements that should be made to protect habitats and biodiversity:

- Local authorities should be given a positive duty to protect local biodiversity.
- Previously developed brownfield sites that are usually prioritised for redevelopment sometimes have significant biodiversity value, not least because they have frequently been left undisturbed for years; such sites should be protected.
- The same level of protection currently given to Sites of Special Scientific Interest should be given to irreplaceable natural habitats that are currently unprotected, including remaining areas of ancient woodland and upland moorland.

Housing and land availability

Of course, in planning terms, protecting the environment is often seen as protecting the countryside, and perhaps the most controversial planning issue of all is how to provide the huge numbers of new houses needed while minimising intrusion into the countryside. The most popular way of achieving this is to build on brownfield sites, but this is not always possible, especially in areas of high demand where much of the brownfield land has already been used. So we do need other measures to minimise the take of greenfield land.

One approach has been to increase housing density, which has too often led to some poorly designed developments with little greenery or amenity space. But this need not be so; good design can produce attractive and popular developments with high densities. For example, the Greenleys development in Milton Keynes has a comparatively low density of 25 dwellings per hectare but is much less attractive and has lower property values than the nearby Wolverton development which has a density of 52 dwellings per hectare; the major difference is that accommodating the car was a priority in Greenleys while Wolverton has given priority to walking.

We need more research into ways of minimising the land devoted to the car within residential areas. Key objectives should be to minimise the total space devoted to roads and parking, putting higher density housing nearer areas of good public transport to cut the demand for car ownership, and

incorporating, as far as possible, roads and parking spaces into the community living space through genuine shared space design and landscaping.

One major hurdle to maximising the sustainability of new housing is the near-monopoly in the control of development land in many areas. In 2008, 47 per cent of all homes were built by just seven house-builders, and the large building companies held strategic land banks equivalent to more than fourteen years of development. In 2011, the Campaign to Protect Rural England estimated that the biggest developers held land with planning permission for more than 280,000 housing units. And at the beginning of 2012 one major house-builder held a land bank sufficient for 63,000 new homes – yet it had built fewer than 10,000 homes in 2011.

Land is, of course, a finite resource that cannot be moved from place to place. So when most of the land identified for development in a particular area has been bought up by just one or two developers, this near-monopoly inhibits the competition that should help drive higher sustainability and design standards, and may slow delivery as house-builders seek to keep market prices high. This near-monopoly has contributed to the demise of many of the small construction companies that have traditionally been important to their local economies and are often more sensitive to the local vernacular. Some of these smaller developers are also the leaders in sustainability and innovative design.

The huge land holdings of the big developers have also inhibited self-build: a report by the National Self Build Association in 2008 found that the major obstacle to increasing the number of self-build homes was the availability of land.[5] This matters because self-builders have been shown to drive significant improvements in housing design and performance, as well as providing more variety than is the norm on so many British estates.

Opening up the housing land supply to more competition would contribute to speeding up development, enhance design and sustainability standards, and develop local economies. We therefore welcome the recent IPPR report, *We Must Fix It*, which calls for the diversification of the industry, in particular by bringing in new entrants.[6]

One IPPR proposal that we would like to see implemented is the registration of all land ownerships (including options to purchase) with the Land Registry; this would reveal where competition is being inhibited by land banks held by the major developers. Where this is the case, any land disposal by a public authority should seek to favour small local builders and new entrants, learning from the Public Land Initiative piloted by the Homes & Communities Agency in 2010 which resulted in successful bids from construction firms prepared to accept lower profits and fast build-out rates

rather than the traditional vertically integrated house-builders, which profit as much from land trading as from actually building homes.

To encourage self-build, we propose that a fifth of all public residential development land disposals should be allocated for self-builders, that Local Development Frameworks should include a policy allocating a percentage of all larger sites for self-build, and, in areas of high growth, that larger areas of land should be allocated for self-build. While the servicing of self-build plots and their subsequent sale could be left to the site developers, such projects are well-suited to community land trusts or other community-based groups and these should be encouraged through the neighbourhood planning process.

We also propose that the government should commission an independent study into the way in which land becomes available for development and how this might be improved; this should be wider than the 2007 Office of Fair Trading study and include such issues as the constraints that the system places on design quality, sustainability and innovation. It should also examine whether the huge increase in land values that results from the granting of planning permission is fairly distributed between landowners, developers and the community and how the financial gains might better be used to create sustainable communities. We would expect this study to examine such proposals as the IPPR's suggestion that the government should act as a clearing house for the land banks of failing house-builders, and those put forward by Dr Tim Leunig (when chief economist at Centre Forum) for using community land auctions to drive down market land prices while enabling local authorities to separate land trading from house-building.

Design and sustainability

Increasing competition between house-builders should encourage higher design and sustainability standards. But, with housing representing nearly 25 per cent of all current UK climate change emissions, it is clear that the UK's existing housing stock must also be tackled, as well as ensuring far higher standards of environmental performance in new developments. Building regulations provide a welcome floor, but not an incentive to go further. Planning authorities should insist on higher standards wherever possible, not least because the lifetime savings on energy bills are likely to more than offset any increased building costs.

A good incentive to increase the environmental performance of buildings is that of insisting on 'consequential improvements'. This is where anyone requiring planning permission to change or extend a building should, as a condition, apply cost-effective energy efficiency measures to the existing property. This

was introduced in 2006 by Liberal Democrats-controlled Uttlesford Council for homes where it was 'possible and practical'. Key barriers to people undertaking energy efficiency work is the hassle and management of contractors involved. There are therefore good reasons to encourage people to think about energy efficiency when they are already undertaking construction work.

We also want better integration of highway planning into the design of new developments. Too often highway planning takes place in a silo, with the highways authority involved only as a statutory consultee when an application is submitted rather than being involved at the design stage with the planners, architects and designers to create clutter-free, liveable spaces. Exhibition Road in Kensington shows what can be achieved when highway engineers are part of the design process. Safety is important but so too are liveable, pleasant spaces.

Another initiative to improve sustainable development would be ensuring informed impartial review of the design of significant applications, through the kind of Regional Design Panels set up under the now defunct *Commission for Architecture and the Built Environment*. Not only would these deliver the capacity to review design but they would also provide planning staff with the opportunity to find out about best practice elsewhere and develop the knowledge and skill base within local authorities while helping to make a reality of integrating design into delivering sustainable development.

The issue of water resource efficiency needs far more attention, given the impacts of climate change and a rising population. Given regional variations in water scarcity, different areas will have different sustainability priorities. So local authorities in, for example, the East and South-East of England should be free to push for stricter standards than prescribed by building and other regulations.

All new housing developments in areas of water stress should become 'water neutral', with increased water usage offset by efficiencies elsewhere. We support the introduction of compulsory smart metering in water-stressed areas by 2020 and strengthening planning guidance in favour of compulsory rainwater harvesting, grey water recycling, green roofs and sustainable urban drainage systems where appropriate. This could be complemented by fiscal incentives such as preferential VAT rates for rainwater harvesting systems, as has been introduced in France.

Large-scale developments

A major advantage of planning a large-scale development is that low- and zero-carbon solutions can be laid across the whole town if financing and

other barriers can be overcome. This can be part of the attraction of garden cities – in addition to the benefits of having places that are, as David Cameron has said, 'Green, planned, secure, with gardens, places to play and characterful houses, not just car-dominated concrete grids'.[7] The principles governing garden cities – that of stronger community engagement and ownership, long-term private sector commitment and visionary design – are applicable to different models of large-scale growth, from the free-standing to clusters of linked new towns and sustainable urban extensions.

But there are significant barriers to creating large-scale sustainable new communities based on garden city principles. The Town & Country Planning Association, in its recent report *Creating Garden Cities and Suburbs Today*, highlights the need for serious and sustained political commitment to deliver such schemes.[8] It identifies the potential of using surplus previously developed public land as a way of partly overcoming the issue of unlocking land for sustainable development, and has suggested that the Green Investment Bank could be used to provide low-cost, long-term loans to boost the sustainability of major housing developments and through local-authority-led partnership approaches.

Planning and business

Whilst house-building and construction in general is important to the economy, the planning system is often seen as an obstacle to economic growth and being anti-business. A survey of 5,300 businesses carried out by the British Chambers of Commerce early in 2012 showed a general lack of confidence in the planning system, describing it as 'Beset by cost, complexity and inconsistency'.[9] One key improvement would be the universal availability of non-binding advice from planning authorities prior to the submission of a formal planning application, in order to clarify policy issues with which businesses, especially small businesses, are unlikely to be familiar; this is especially necessary for environmental protection policies. Providing such help ought to both improve the quality of applications and speed up decision-making by avoiding refusals on grounds that could have been averted.

Sensible compromises should be sought even where businesses and environmentalists usually take immutable stances, such as the interpretation of the Habitats Directive. One example is the blanket 1,500-metre buffer zone placed around Special Protection Areas (SPAs) to safeguard nesting stone curlews, preventing any development even where existing buildings and activities are present. In Norfolk, Natural England, the RSPB and local landowners have agreed a draft policy that would allow some development for

existing businesses within the SPA, providing that measures are put in place to minimise disturbance to the birds – a compromise that goes some way to meet rural development needs while still protecting the birds.

But it would be wrong to see the planning system simply as a way of moderating economic development to protect the environment. Good planning contributes in many ways to the long-term health of businesses and the economy.

It does this both directly and indirectly. For example, setting high standards to ensure that new buildings use energy, water and other resources efficiently reduces business costs and usually provides a net financial gain for those occupying the building. This is especially important when those submitting planning applications are not those who will finally occupy it, as they have little incentive to invest the extra money to make the long-term savings.

At a wider level, good planning can encourage the development of communities with the high-quality environments demanded by the professional, skilled, creative and usually highly mobile staff so essential to growing businesses. And there are numerous studies demonstrating that the provision of high-quality open spaces within communities has significant physical and mental health benefits which, of course, have obvious benefits for employers.

Planning also has a key role in protecting the cultural, historic and landscape value that is so vital to tourism, an industry that already generates £97 billion each year and employs more than 2 million people in England, not far off the number employed in manufacturing.

Finally, in enforcing high sustainability standards, planning can enhance the demand for some of the green products that are so crucial to the growth of the economy.

We recognise the frustration felt by some green industries confronted with constant planning refusals on grounds that they consider to be dubious; King's Lynn & West Norfolk Borough Council has never approved an application for a wind turbine despite neighbouring authorities giving approvals for comparable sites with no resulting problems. Clearly, wind turbines should not be given permission in areas of outstanding landscape attractiveness, but they are a significant part of the mix of non-fossil fuel energy sources that the UK needs. We suggest that a system of financial incentives similar to that being provided by the government for new housing should be mandated for new wind farms to be paid by the developers to the individual households and communities directly affected, possibly through reduced energy bills.

Land values

Whether the new fiscal initiatives – the New Homes Bonus and Community Infrastructure Levy – will result in more development in areas of the country where more homes are required remains to be seen. For us what is key is ensuring that the capital gains from changes in land use are spread fairly, meet the identified needs of communities and provide for the ongoing upkeep costs of any infrastructure provided.

Land value taxation (LVT), which raises public revenue through an annual charge on the rental value of land, an idea long espoused by Liberal Democrats, could play a key role in capturing the increase in land values created by the community agreeing to allow its development. LVT would discourage speculative landholdings and encourage the redevelopment of brownfield sites and the efficient use of land, thus minimising the demand for greenfield development.

Until LVT is introduced, we should implement a Greenfield Development Levy to encourage the development of brownfield land and to pay for local infrastructure as a way of compensating communities for the loss of amenity.

There are two other fiscal measures that we believe are important. First, the Community Infrastructure Levy must be used to ensure the long-term maintenance of any new public facilities as well as providing new infrastructure. This would help overcome the lack of resources that is allowing too many public open spaces and other facilities to suffer from neglect. Second, VAT on new build and renovations should be equalised on a revenue neutral basis to remove the current disincentive to repair existing properties.

The proposals that we have outlined in this chapter will make the planning system more responsive to the needs of local communities and ensure that our countryside and towns and cities provide the economic, social and environmental setting necessary to provide people with a high-quality and sustainable quality of life.

Our proposals are based on the belief that investment in well-designed and sustainable developments will, over their lifetime, more than pay for any higher capital costs, as well as providing quality environments in which people can live, work and enjoy themselves. We believe that localism not only means giving communities greater control over what happens to them but also giving them more opportunities to maximise the benefits from the land around them.

Climate change, failing biodiversity, inadequate housing, environmental degradation and poor economic performance are enormously challenging. They can only be tackled by positive planning guided by a vision of what kind

of future we want, a vision that must be long-term but must also be bought into by local communities.

Notes

1 See http://www:chichestercdt.org.uk
2 Study carried out by Richard Mitchell of Glasgow University and Frank Popper of the University of St Andrews, published in *The Lancet*, 7 November 2008.
3 See www.bristol.gov.uk/whofeedsbristol
4 For more information on this community-led project, which is re-engaging people with food and building community cohesion, see www.incredible-edible-todmorden.co.uk.
5 National Self-Build Association, *Self Build as a Volume Housebuilding Solution* (October 2008).
6 Matt Griffith, *We Must Fix It* (IPPR, 2011).
7 Speech at the Institution of Civil Engineers, 19 March 2012.
8 Town and Country Planning Association, *Creating Garden Cities and Suburbs Today* (TCPA, May 2012).
9 See http://www.britishchambers.org.uk/press-office/press-releases/bcc-no-going-back-on-radical-planning-reform.html#.ULJfhIYlfUY

Chapter 25

How to Save Our Cities from Economic Collapse

David Boyle

When the first Liberal mayor of Birmingham, Joseph Chamberlain, addressed councillors in the 1870s, he told them to 'be more expensive'. This is not, of course, the kind of language you expect from local politicians these days, but in fact I suspect the meaning has changed. What Chamberlain meant was 'more ambitious'. Ambition was the cornerstone of his work in Birmingham, which his colleague Jesse Collings described as the business of having it 'parked, paved, assized, marketed, gas & watered and improved'.

At the end of 1873, Chamberlain had seized control of a city that was in a desperate state. The problem was not just extreme poverty as the premier city of the Industrial Revolution had burgeoned in size. It was environmental. The poisoned rivers, and dodgy, very occasional, water supplies were well known.

He and his Liberal colleagues took control of the city from a group of independent councillors who met regularly in a pub called 'The Woodman' and who prided themselves on their ability to avoid spending any money. They called themselves the 'Economists'. There has always been a very English strand of pragmatic economics which believed it was all about avoiding spending; that isn't the Liberal way.

I start with Chamberlain because he is in some ways a very modern hero. He revived Britain's second city, paved it, lit its streets, and infused it with enormous pride, and he built parks and galleries and concert halls. But the key point was that he did it using the assets at his disposal – the foul water, the money flowing through, the local people. He did not wait for central government grants or plead for corporate sponsorship. He used the assets he had.

That is important because in the new economic dispensation – a combination of dwindling resources and climate change – that is exactly what we are going to have to do ourselves.

A century of cheap energy has driven the shape of our cities. They are dependent on cars but they are also extremely dependent on imports. Development in most parts of the world has concentrated on transport

infrastructure which has, among other effects, deepened this dependence. It has also encouraged cities to specialise, based on the economic doctrine of comparative advantage – an option that is simply not open to many, if not most, places in the world.

Since the 1920s, and the introduction of refrigeration, cities have become used to having their fresh milk and other food trucked in during the night, and the farms that used to be such a feature of city life until then have gone. We have also lived through a generation where environmentalists and architects have teamed up to call for denser cities on the grounds that they use less energy. It isn't so: dense cities are specialised cities where people live – sustainable cities will have to be spread out enough to produce their own food, deal with their own waste, make their own things. They need to be spread out enough to be green.

But the main reason why the shape of cities is going to have to change – economically as well as topographically – is the rising cost of energy. The Stern Report finally brought the business of global warming into the remit of old-style economists.[1] As we reach the peak of oil production, we can almost certainly expect major hikes in the price of oil, combined with enormous and unpredictable dips. This will turn all the assumptions of recent generations about the economics of local production on their heads.

We have developed many of our institutions in a period where energy was so cheap that it was worthwhile to truck a consignment of beans grown and picked in the Netherlands down to Italy – or further afield – just for packaging, and then send it all the way back again. Our just-in-time distribution systems depend on cheap energy. If energy becomes expensive, none of that works any more. We need to find not just decentralised sources of energy, which no longer waste a third in transmission, but decentralised food production systems too – and those are likely to include very small family production as well, which will increase access to land for the poorest.

The question is no longer whether aspects of this massive localisation is going to happen, but – if energy becomes expensive – *when* it will happen. That puts cities in the frontline of change. The problem is that some of them are not very well equipped to deal with it. Because local government has been so constrained over the past two generations by two generally accepted truths that were both completely wrong: one, that the economic levers have until recently all been in Whitehall; and two, that all they can do is to beg for government handouts or major corporate investment.

The first is wholly illiberal. In fact, there's really no point in decentralising political power to cities and communities if they remain supplicants to Tesco

or Barclays. The second is unfortunately still the mindset of some parts of local government. Of course, outside investment is important, but cities will need to look increasingly to their own resources to feel their way into the new world. The coalition's Localism Act is an important first step, but how do they use it? What will sustainable economies look like in green cities?

The following are three propositions that I believe will need to guide cities and towns in the future, and they are all based on Joseph Chamberlain's approach of using what you have got.

It isn't how much money you have going into an area that counts, it's how you use it

This is one of the key insights of what I call the new economics.[2] It means that there might be places with the same amount of money coming in, but in one of them it gets spent in the supermarket and then it leaves the area straight away. But in another place, the income gets passed on from local business to local business, over and over again, like blood. It is the same money, but every time it changes hands, it creates local wealth. It is not the total amount of money that is important here. It is the diversity of business, and maybe even the diversity of people that matters – because they can keep money circulating.

Ten years ago, my colleagues in the New Economics Foundation were struggling to find a language to describe this idea so that anyone could understand it. We borrowed the idea of a leaky bucket to explain the way local economies worked.[3] The problem is that the bucket never stays full, but it can be made to leak less. We came up with a formula for estimating where local money gets spent, tracking it through three exchanges, and seeing how much of it stays put. We called it LM3 (Local Money 3), and you can use it online (lm3online.org). It is supposed to be a way in which cities can weigh up different investment options – or measure how healthy their local economy is, or businesses, or charities too. We found that spending £5 in a supermarket chain was about half as useful to the local economy as buying vegetables from a local farm.

The implications of this are pretty far-reaching. If you have a high street where all the stores are owned by big chains, you may be more vulnerable economically than a high street where there are many interdependent businesses trading with each other – though this might not be nearly as wealthy. One will survive an economic downturn; one may well not.

This is critical also to the way in which cities and towns spend their money, and who they commission to run local services. A small shift in the

local government procurement spend that goes to local businesses and gets re-circulated locally by them can make a huge difference to the local economy.[4] It means that they can develop in the way that cities have always done historically, which is by finding ways to replace some key imports with local production. It also means there is less trucking around of resources, and it means that local resources – and local waste – can be used more efficiently. And it means that local money goes to local energy production, and local jobs, rather than to distant centralised utilities.

Of course, I am not arguing that it makes no difference at all how much money is coming in. It does. But it also matters very much where that money is going and how it is used. It therefore matters what size procurement contracts are (big contracts may have to go out of the area). It also matters that councils learn the difference between a fake anchor store which hoovers up local spending and corrodes the businesses around it and a real one which genuinely supports the surrounding local economy. It matters that they know how and where local money circulates.

Before William Harvey announced, in 1616, his theory about how blood works, most people thought it was made in the liver and the heart and swallowed up by the other organs. Harvey showed that it was the *circulation* of the blood that really mattered. If nothing circulates, the patient dies. It is the same with local economies. If the money goes round, the place lives. If it doesn't, it dies.

One city which has been running with this idea is Cleveland, Ohio, the US city most hit by the sub-prime mortgage crisis. There are two major economic players still active there: the university and the hospital. To put the hospital to better economic use, they have borrowed an idea from one of the great success stories of co-operative business, in Mondragon in Spain. The Mondragon story dates back to just after the Second World War, when the local Catholic priest founded the first worker's co-op to employ local people and meet local needs. Half a century on, there are now 256 linked co-operative businesses, employing nearly 100,000 people and with offshoots worldwide, and they have been doing even better during the global downturn – so much so that the US steelworkers union has signed a long-term agreement to do something similar in North America.

Now the Evergreen Project is doing this in Cleveland, but clustered around and dependent on the hospital, starting with a sustainable laundry business.[5] The second project is a renewable energy company, starting with installations on the hospital roof. So there are two elements to this innovation: new co-operatives that employ local people, and give them a real stake

in their success, but which are also redirecting the spending power of the local hospital to launch them and underpin them.

The hospital has to agree that these contracts represent the best value to them, but of course hospitals have an interest in a thriving local economy, because it reduces acute demand.

Not all economic resources are monetary

The money already flowing through a local economy is not something that has exercised local authorities until recently. Nor has it exercised the Treasury, but it is an asset that can be used to rebuild thriving economies. So is wasted land, or wasted buildings. So too is the distinctiveness of the local area, because people want to live and invest in places they think are real. So is wasted furniture or reject white goods or other kinds of rubbish which might actually be turned into raw materials. So is compost and old food or old furniture, which can be used for training. And putting these wasted resources to better use is more sustainable.

The doctrine of comparative advantage suggests that cities must specialise. It makes sense to be aware of what you are best at for any town or city but, throughout history, cities have grown and developed by replacing their imports, by plugging those money leaks and by keeping the money circulating locally. That means they have to treat their diverse populations as assets, rather than as deadweight claimants on services – as brilliant, imaginative, determined people who can make things happen.

When my New Economics Foundation colleagues start work somewhere new, they don't say: 'what needs fixing here?' or 'what's the problem here?' They ask whether anyone has any ideas or dreams they want to achieve. If they do, they get linked up, not with the usual ubiquitous training programme to tell them how to write business plans – Labour's contribution to entrepreneurship – but with a coach. To be precise, an enterprise coach.

We called this approach, pioneered with the Civic Trust, BizFizz.[6] The coaches work with local people and ideas and do whatever is necessary to make them happen. If that means helping get childcare so that their client can go to the bank, that is what they do. They are backed up by a panel of local business people, bank managers and other local volunteers, who meet once a month and give the new enterprises advice. These panels behave like successful networks do in successful places. They explain that they have a cousin with a lock-up garage, or offer to put in a word with the local bank. They are absolutely critical resources – just like the empty garage is – and they are not monetary at all, like the wasteland that could grow things or the

empty council office that could house start-ups, or the rubbish that is actually a resource for some other kind of business.

My favourite story about local assets is about the Marsh Farm estate on the edge of Luton. Marsh Farm was a symbol of a place where the money barely circulates. It comes in by benefits cheque and then goes straight out again. But they did one of our LM3 surveys and they found that, between all the households, they were spending a million pounds of their money every year on fast food outside the estate. That is a million pounds leaking out of the bucket.

So they started a new business, employing local people, to provide healthy fast food. Then they leased some unused fields next door from the council and grew some of the ingredients. And so it goes on. That is sustainability in practice: it means that local resources are used better, less has to be trucked in, and the local economy benefits too.

My colleagues have been doing similar things with immigrant groups outside Tel Aviv, in shanty towns in Honduras and Lima, and outside Durban in South Africa. What is fascinating is that we are often told by local development agencies that there is no entrepreneurial flair locally. Yet, in Durban, 174 people showed up at our event, and put forward 100 business ideas, and 82 were then supported by the business coach.

If we are honest, there has been a similar problem here. Whitehall has never really believed that our cities were enterprising places, so they have ignored this resource. Cities that waited as supplicants to Whitehall ignored these resources too. But the new low-energy cities will have to look to local resources that much more, and we can ignore them no longer.

Innovative local institutions matter

Why do regeneration agencies traditionally believe there are fewer entrepreneurs in economically disadvantaged communities? That has never been clear. Our experience has been that, despite what people say, there is rarely any shortage of people with ideas. But there *is* a shortage of confidence and a shortage of effective social networks. Most of all, there has been a shortage of local institutions, and the UK has been poor at borrowing the ideas for these local institutions from other countries.

Community-supported agriculture is a way of providing finance for small-scale local food, but it has been very slow to take off in the UK.[7] Small business currencies, or credit circle factoring, are both supported by the European Commission in Latin America, but there is almost nothing like them here.[8] Partnership banking, and other kinds of public sector banking

– like the Bank of North Dakota (see below) – are all emerging in the US, but there is little that is similar here.[9]

Most of all, productive and sustainable local economies require credit. The bad news is that the debate about the future of banking has got stuck in this country, as politicians try to find new ways to force the banks to lend to small business. Most bankers will agree privately that the problem is not that they are reluctant to lend to small business, but that they are no longer set up to lend effectively in that sector. Their systems don't allow it. They allow no useful local knowledge.

That means that the real issue is how we get that local lending infrastructure we need – and, once again, the issue is not really about new money. There is a great deal of money, some of it in local authority bank accounts which is currently invested in London or in the next asset bubble. What we lack is the local institutions capable of lending it profitably and investing it locally.

Here, Britain is different from other European countries. We all have our highly centralised banking oligopolies, focused on global speculative finance, but they have an effective, stable, community-based banking sector as well. We don't and we badly need one, especially if the sustainable new economy is to thrive here.[10] New businesses require finance to start with.

It may be that this urgent lending infrastructure can be created under US-style community reinvestment legislation. That means that the big banks will create the infrastructure to lend where they are unable to. It may be that this can be done voluntarily by the banks in order to end the damaging debate about whether they are lending to small business. But equally, the new banking sector could be set up by local authorities themselves as a place to keep some of their money, and to invest it locally – using local knowledge that the big banks don't have.

One model might be the Bank of North Dakota, set up by the state of North Dakota in 1919, the same year in which Neville Chamberlain launched the Birmingham Municipal Savings Bank. It is profit-making, and has contributed over US$300m in dividends to the state's coffers over the past decade. It works by partnering local banks to provide the loan finance for small business lending on specific deals. Their lending portfolio is mainly these participation loans, which allow local banks to lend more.

There have been no local bank failures since 2008 in North Dakota, and no bank in the state has more than 10 per cent of local deposits. The existence of a powerful 'partnership bank' has underpinned a diverse banking system there. In 2011 Oregon, Washington and Massachusetts introduced bills in their state

legislatures to launch their own state banks. Maryland has followed suit since. Illinois, Hawaii and Virginia are already looking into the idea.

The point is that sustainable cities do not emerge by themselves, or just by cutting back the public sector. They require institutions that can put people and money together, either from business partners or from potential customers. Institutions are vital. If we want to use waste as raw materials, or drive the take-up of household energy saving and energy generation, it requires business to do it – and that requires credit, and we have allowed our credit institutions to atrophy or become too regional, or uselessly virtual. These trends will have to be reversed.

~

These are three propositions for the future. The key point is that we have to produce locally again if we are going to prevent places sliding into hopeless dependence. We also have to produce locally if we are to avoid the cost and the damage of increasing transport emissions. That means we have to use the resources we have got more effectively. Sustainable economies are much more local than they are now; they use resources more effectively and require less infrastructure.

But this is, in some ways, not such a revolutionary idea. Cities have always dragged themselves into viability by local production, whatever policy-makers tell you. They do so not by specialisation but by import replacement. They do so by recognising the assets they already have and putting them to work.

But there are important lessons here. The new economics is still feeling its way towards many of the answers, but it asks challenging questions of the status quo – the ruling elites with their creaking economic ideas – and those questions imply something about where the answers might lie. People are poor because the assets they need have been taken from them, or simply devalued, leaving them impoverished. It implies that if we can recognise those assets, measure them and put them to use, we might begin to make real, unambiguous progress.

If the legal and organisational economic institutions of the world are weighted in favour of the rich, then we need to reform and reorganise those institutions, whether they are international or local. Out of these questions, new directions and concepts begin to emerge – together with a whole raft of new, more difficult questions. How do we provide resources for welfare in a low-growth economy? How do we sell the new economics to those whose privileges will be undermined?

Many of the original campaigning demands of the new green economics, as set out in the 1980s, are also now mainstream. Green taxation is limited but is on the political agenda all over the world. The ideas behind environmental and social auditing of companies are widely accepted, and many companies produce reports even though their variable quality merely highlights the limits of voluntary approaches to corporate responsibility. Around £10 billion is invested ethically in the UK alone.[11] New ways of measuring that reveal the true environmental and social success or failure of the economy are starting to push older, cruder measures aside. There are anything up to 9,000 complementary currencies (parallel currencies denominated in values other the national currency) in the world.[12]

For the time being, the issues that have caused so many problems over the past half-century or so remain as powerful as ever. We still have the combination of implacable centralisation and an industrial policy gauged to suit the City of London – that is, low-to-zero regulation, massive political support, bailouts for failures. That is what has distorted the economy, undermined proper investment in sustainable transport infrastructure, and left us with the weak institutions that are unable to row against the tide that draws investment and people to London.

The horns of the dilemma we are now caught on is that central government thinks of economics as their remit, but they do not have the levers that can make a difference locally. Local government has some of the levers available but still believes, in some places, that they are dependent on the centre to shift their economic fortunes. What I have argued here is that, just as our cities have the power to bring their energy and imagination to bear on the problems of sustainable economics, we also increasingly understand what has to be done.

So here is my ten-step programme for the cities.[13]

Plug the leaks that are draining local money away: that means setting up sustainable businesses and social enterprises that can use local resources to replace some of the leaks in the local economy.

Local diversity and distinctiveness: places that feel authentic attract money and people.

Bust local monopolies to let enterprise flourish: when all the groceries are provided locally by one supermarket chain, or when the only available contractors for local waste contracts are the handful of national giants, then it will undermine the energy of the emerging sustainable local economies.

Enterprise coaching, support and advice in every neighbourhood: along the lines pioneered by BizFizz, to create new locally-owned businesses.

Build an effective new local lending infrastructure: we need local banks for the new sustainable businesses we need.

Invest in local energy and local food: these are two areas where local economies can replace scarce imports.

Use waste products as raw material for new enterprises: sustainable local economies are increasingly circular, but again that needs new social enterprises to make it happen.

Use public sector spending to maximise local money flows: in impoverished areas, it makes sense for local procurement to encourage local business, and green business in particular.

Experiment with new kinds of money to provide credit, like the new currencies of Latin America which are designed to tackle local poverty and provide credit to small business.

New credit creation for local public benefit: it is time to experiment with new ways of creating national currency that can provide a stream of quantitative easing, created by the central bank, not the commercial banks, which can provide the capital to underpin a Green New Deal that can build the new local energy infrastructure we need.

This last one is, in some ways, the odd one out because it requires central government to lead. I don't mean through mechanisms such as quantitative easing, which just drives money to the big banks and stays there. But it is becoming clear that relying on credit creation by banks – which are mainly geared up to produce the next mortgage bubble – to provide society with the means of exchange they need to make their economies work is not enough. We need a more effective and reliable way of creating money. We need publicly created money to grow the green, productive economy, and get people back to work.

That means that the Bank of England should exercise its power to create money to provide the loan finance for the new local lending or green infrastructure without wasteful payments to financial intermediaries. This should then be repaid, free of interest, when the task is complete, and then withdrawn from circulation.

~

So there we are: a ten-step programme for green cities. It is true that not all of these ideas can be organised tomorrow, at least without central government support. Getting the banks to fund a new community banking infrastructure – capable of supporting the small business market, as they do in the US

– depends on some co-operation between the banks. But most can be done by imaginative and forward-looking city leaders, and can be done immediately with the new powers under the Localism Act.

Most of these ideas have been put into practice somewhere already. What has not yet happened is for enlightened local government to knit all these approaches together and claw their way out of recession by doing so, and set their cities further along the path to sustainability. That is the challenge. This is a potential revival of the idea that cities can claw back some measure of self-determination and vision, not because someone can be persuaded to give them the money – but because they have the assets they need already. Because these are ordinary renewable assets, this agenda is about sustainability in its broadest sense.

Notes

1 Nicholas Stern, *The Economics of Climate Change* (HM Treasury, 2006).
2 See for example, David Boyle and Andrew Simms, *The New Economics: A Bigger Picture* (Earthscan, 2009).
3 Justin Saxchs et al., *The Money Trail* (New Economics Foundation, 2004).
4 See, for example, Matthew Jackson, *The Power of Procurement* (Centre for Local Economic Strategies, 2010).
5 See Gar Alperovitz et al., 'Cleveland's worker-owned boom' (*Yes*! Magazine, June 2009); http://www.yesmagazine.org/issues/the-new-economy/clevelands-worker-owned-boom
6 See Paul Squires et al., *Who's the Entrepreneur?* (New Economics Foundation, 2007).
7 See Steven McFadden, *The Call of the Land: An Agrarian Primer for the 21st Century*, NorLights Press, 2009).
8 See www.socialtrade.org
9 Jason Judd and Heather McGhee, *Banking on America* (Demos, 2011).
10 See David Boyle, *A Local Banking System: The urgent need to reinvigorate UK high street banking* (New Economics Foundation, 2011).
11 See www.eiris.org
12 Peter North, *Money and Liberation* (University of Minnesota Press, 2007).
13 See David Boyle, *Ten Steps to Save the Cities* (New Economics Foundation, 2011).

Chapter 26

Power to the People? The Case for Community-owned Renewable Energy

Steve Bradley

If American psychologist Abraham Maslow was developing his famous hierarchy of needs today, he would surely consider adding 'energy' to his list of basic human requirements. Mankind has created societies whose orderly functioning is increasingly reliant upon technology, appliances and vehicles which all require some form of energy. It is difficult to comprehend how ill-prepared we would be for a prolonged and widespread outage of power or fuel, and the social and political consequences which that would trigger. Yet that is the 'do nothing' scenario predicted to be only a decade away if we fail to address the looming capacity problem in the UK's energy generating infrastructure.

Uniquely amongst the three main parties in Britain, the Liberal Democrat approach to politics is generally to strive for *local* solutions to problems – underpinned by a belief that issues are best addressed with reference to the communities and circumstances within which they manifest. So how can we address the large-scale national energy problem the UK faces without losing sight of our localist and liberal principles?

This chapter considers the challenge of moving towards zero-carbon energy provision in terms of its interface with principles of community, democracy and liberalism. It outlines the overall challenges and opportunities in our shift towards low-carbon energy, analyses and critiques the government's current approach, and signposts a number of ways in which liberal principles could direct future energy policy to ensure that it is not only technically appropriate but also supports the provision of community-owned renewable energy (CORE) infrastructure.

What is wrong with our current energy system?

The UK's energy system faces a number of fundamental and well-documented challenges, at the root of which lurks an impending capacity shortage. Almost a third of the nation's electricity comes from coal-fired

power stations – infrastructure that is highly polluting and nearing the end of its lifespan. To keep the lights on whilst meeting carbon reduction commitments, these facilities need to be decommissioned within the next decade and their output shifted to less polluting infrastructure. Failure to ensure a seamless shift risks not just power cuts, but also serious economic, social and political consequences.

The replacement of our most polluting and outdated power plants would ordinarily be championed as a real opportunity to meet our carbon reduction targets. But the challenge of what form those replacements should take – or more precisely, what fuel source they should use – is the source of much controversy and debate.

When faced with a complex decision in government, one's political principles ideally offer a helpful compass with which to navigate the maze. For Liberal Democrats, that means asserting that individuals and communities should have the maximum freedom to decide and pursue their own priorities as best they can, whilst demanding an acceptance of individual responsibility and a sense of duty towards one's fellow citizens and community in return. It views the state's role as one primarily of enabling and informing, rather than controlling and directing, with its fundamental duty being to help create 'agency': the capacity for individuals and communities to make *meaningful* decisions about their circumstances and to influence the world around them.

But for proponents of liberalism and the quest for agency, our principles merely highlight a further problem with the UK's energy system. Viewed through the prism of individual and community agency, our energy system is the antithesis of liberal. It is anti-competitive, unaccountable, undemocratic and, by virtue of energy's necessity to modern existence, it greatly erodes the ability of individuals and communities to influence meaningfully their circumstances. In short, it is illiberal.

The uncompetitive nature of the UK's energy market is due to its domination by a de facto cartel of six huge mainly foreign-owned companies. Normal economic rules dictate that the presence of large financial returns should act as a stimulant for new providers to enter a market. With our energy system structured so heavily around large-scale centralised production, however, it has become a natural oligopoly which stifles genuine competition. Centralised energy production is the norm in the UK, and the cost of establishing a gas-fired or nuclear power plant is so huge that we can realistically expect no large-scale new entrants while it remains so.

The energy market lacks democracy and accountability because, as with all economic oligarchies, the UK's 'Big Six' operate in splendid isolation.

Occasionally they feign responsiveness to ward off the slim chance of significant government intervention in their cosy consensus. But despite the central role that energy plays in our modern society, they remain largely unaccountable to the society they serve simply because they can. After all, who else could we turn to for our heat and light?

In addition to these philosophical flaws with our centralised energy system, it is also unsatisfactory from an efficiency perspective. Few people want to live near a large power station, so we generate our electricity in huge quantities far away from where the output is most needed. That leads to two fundamental inefficiencies. Firstly, the production of electricity by gas, coal or nuclear power generates a large amount of heat as a by-product. Isolated power stations have few domestic or commercial neighbours to take advantage of this, so it disappears up the chimney as waste. Whilst the latest gas power stations can achieve efficiencies of up to 60 per cent, in practice our power stations (and particularly the older ones) have efficiency levels nearer 40 per cent. That means that they convert less than half of all the energy they consume into electricity, with the rest being dumped as waste heat. And there is little thirst within the power sector to address this. A recent informal consultation with the Big Six energy companies by the Department for Energy and Climate Change showed that most were opposed to any suggestion that power generation should be made more efficient through the mandatory recycling of waste heat for buildings.

The second problem arises when this centrally produced electricity is transmitted to where it is needed. Transmitting electricity over long distances results in about 7 per cent of that power being lost naturally along the way. So we produce electricity centrally in vast quantities in isolated locations, waste half of it in the generation process, and then lose a further 7 per cent of what is left in transmission – all before it gets to the people it was created for in the first place.

Finally, centralised energy production is increasingly out of tune with a world where energy security is a growing issue. The political stability of the countries which supply our gas cannot be guaranteed. And our energy infrastructure (particularly nuclear) would be an obvious target for ideologically motivated terrorists. Dispersed energy generation would greatly reduce both these threats whilst also providing localised control over an essential commodity.

What is the alternative?

Combining the liberal principles of localism, agency and genuine competition with an acceptance that centralised energy generation is inherently unfit for purpose can only lead to one conclusion. We need to enable, as far as

possible, the production and supply of our energy requirements to be taken back to the communities and the people for whom it is being created in the first place. We need a new era of localised community energy.

This suggestion is neither as novel nor as revolutionary as it may at first sound. As is outlined elsewhere in this book, community energy schemes have been a mainstream reality across a host of European countries for decades now.

What currently happens in the UK?

In recent years the UK has introduced a feed-in tariff programme for small-scale renewable energy. Whilst this has led to a boost in renewable energy installations, it has been a rather different experience elsewhere. For example, the German FiT system operates on an open-ended budget, with consumers picking up the costs via their energy bills. The UK model, on the other hand, had a government-managed budget with a ceiling which was quickly exceeded. This led to a sudden and drastic adjustment in the level of FiTs on offer, which created huge uncertainty in this new and growing sector. And when a reduction in the FiT available for larger-scale solar installations was introduced, no attempt was made to differentiate between community groups and commercial operations. So whilst the German model provided a major stimulant for communities and individuals to invest in renewable energy, the UK FiTs approach has reduced the role of communities to a marginal one and limited the scale of involvement for individuals. We have missed an opportunity.

The UK has isolated pockets of district heating springing up, with local authorities like Woking and Birmingham providing a real leadership role. District heating involves a level of scale and complexity which demands the involvement of bodies like councils, who are certainly more democratic than large utilities and private developers. But if our underlying liberal desire is the quest for empowerment and 'agency' via a fully democratised energy system, we need to create an environment which encourages and enables communities and citizens to play a leading role in the creation and distribution of the energy that underpins their lives. Examples of how this has been achieved are given elsewhere in this book.

Encouraging community energy

If one accepts that our current centralised energy system is inefficient, unaccountable, undemocratic and illiberal, and that the development of community-owned renewable energy infrastructure could help tackle these

ills whilst creating agency, then what is required to encourage that change? Different renewable energy sources present different challenges, necessitating a range of responses. As onshore wind is one of the more efficient and most controversial technologies accessible to communities, it offers a useful starting point.

Regardless of one's view on the merits or aesthetics of wind turbines, they undoubtedly have a significant visual impact upon areas in which they are located. It is therefore absolutely right that the surrounding community should receive direct benefits to acknowledge that fact. Yet the case for renewable energy in the UK has been undermined to date by a failure to ensure that those forced to live next to such infrastructure share directly in its benefits. In Germany one fifth of all electricity is generated renewably, with over 65 per cent of installed turbines and solar panels owned by individuals, land-owners or local communities. This high level of community and citizen ownership has had a transformational effect, as resistance eases greatly when it is 'our turbine' being proposed. Conversely, with less than 10 per cent of the UK's renewable energy infrastructure currently in local hands, resistance to specific wind farm proposals is often high, despite research indicating majority support for wind power nationally. The lesson is clear: by ensuring that host communities share substantially in the economic benefits of renewable infrastructure, the relationship between people and energy can be fundamentally changed from one of resentful consumption and opposition to one of empowered and involved self-provision. And with plans significantly to increase wind's contribution to the UK's total energy needs over the next decade, something must be done to address the opposition that it can often attract.

What is therefore required is a sufficiently motivating package of benefits from renewable energy projects which will make individuals and communities more accepting of them, if not actively supportive. And to create agency, such benefits should constitute more than just a minor and passive profit share. Communities should be positively enabled and encouraged to take a direct financial interest (to a suitable scale) in part of any renewable infrastructure located within their neighbourhood. This is particularly important in the case of wind, as the areas of the country with the strongest and most reliable wind source often tend to be isolated, relatively impoverished and limited in both population and economic opportunity. Localised energy offers a liberal route to empower such communities to reinvigorate themselves.

A significant legal barrier facing CORE projects is that they are currently unable to secure a license to sell the electricity they generate directly. Instead

they are forced to sell it to the major utility companies at a significant discount on retail price (e.g. 4.5p p/kWh in the case of solar PV), who then in turn sell it to consumers at the significantly higher market price of 10–14p /kWh. This is an anti-competitive situation which further entrenches the power of large energy companies and prevents communities from providing lower cost energy to their own residents. Suggestions to abolish the mandatory obligation which forces utility companies to buy from micro-generators introduces the real risk that the Big Six will at best reduce the price they are prepared to pay micro-generators or at worst opt to kill off the small energy sector simply by refusing to buy from it.

We need to enable and encourage communities to participate in energy generation and supply consumers directly themselves, or provide an assurance that they can continue to sell to utilities at a fair price instead. In this way we would encourage localised mini-energy utilities to spring up, addressing fuel poverty and applying downward price pressure within the marketplace, along with new and innovative energy supply companies buying their electricity wholesale from a range of community producers before selling it on to consumers – all of which would help to tumble the huge barriers to entry which stifle innovation and competition in our current energy system.

Key government measures

As the above examples highlight, there are barriers which currently prevent CORE from reaching its full potential, or which fail to address the confrontational relationship that has developed towards certain infrastructure. There are six fundamental changes which government could implement which would help to address this situation overall.

First, the efficiency of renewable technology is advancing at a tremendous rate whilst the costs of the infrastructure (particularly solar PV) continue to plummet. This will escalate as demand for renewables increases, continually pushing the generation cost downwards. Meanwhile, the price of electricity from non-renewable sources is rising continuously, with the two likely to intersect at some point as they travel in opposite directions. To both expedite and reflect this dynamic, a new uncapped tapered FiTs arrangement should be introduced. At the point at which the cost of energy from a specific renewable source equals that from non-renewables, its FiT (and thereby its cost to consumers, going forward) should be zero. As in Germany, this change would maximise investor confidence and lead to a boom in individual and community involvement in renewable energy, whilst also ensuring better and more transparent control of the subsidies.

So whilst there would be a cost borne by consumer bills in the short- to medium-term by removing the current cap on the total levy, the boost it would give to the sector would bring nearer the point at which the cost per unit of electricity generated by renewables would be lower than that of fossil fuels, thereby helping drive prices further down in the longer term by cracking open the tough nut of competition in the UK energy market. And it would give a huge boost to the UK's prospects of becoming a major global player in the renewables sector.

Second, a model off-the-shelf Community-Owned Renewable Energy Supply Co-operative (or 'CORESCo') should be developed to reduce the legal costs and complexity for communities in establishing their own. To reflect the differing legal responsibilities of cooperative and commercial organisations (i.e. social responsibility versus profit maximisation), that model should include a distinct legal status for CORESCos. This would enable future differentiation in tax treatment to acknowledge their community value.

Third, to help CORESCos to access start-up capital the Green Investment Bank should have ring-fenced annual funding available on favourable terms for community-owned micro-generation schemes with a credible business and environmental case.

Fourth, CORESCos should be entitled and encouraged to be licensed as community utility companies, to enable them to supply their own residents or other wholesalers. To provide investor confidence, CORESCos that do not opt for direct supply should continue to have the right to supply major utilities at an agreed price beyond 2017.

Fifth, business rates applicable on the entirety of any localised renewable energy installation should be reallocated directly to the local authority concerned, to spend on environmental initiatives within the project area.

And finally, planning law should be altered to ensure that applications for micro-generation proposals (up to a certain capacity) which have the support and/or active involvement of a local CORESCo should include a presumption in favour of the development.

Wind

There are two further measures which would help ease host-community resistance that often arises towards wind installations. One is a requirement that all onshore wind energy schemes (or those within a certain distance of the shore line) should include an annual community payment based upon the size of the installation. These funds should then be locally managed, ideally prioritising energy efficiency measures for both residential homes and community

buildings. A second is that local communities should have the power to purchase and own a certain maximum percentage of any wind infrastructure proposed within their area. These steps would empower communities to both access the benefits of and directly control any local wind installations, which should help remove some of the antagonism that can arise.

Solar

In many ways solar-based CORE projects present less of a challenge than wind. The installations are less visually intrusive, and the dispersed nature of their power source makes them viable across much broader swathes of the country. Unlike wind, solar is also much more suited and viable in urban areas, where electricity demand is the greatest. London and the south-east of England are the most densely populated regions of the UK, and also some of the sunniest and most sheltered. So while wind power would be a non-starter there, solar PV would offer a much more viable alternative, particularly in cities with swathes of south-facing roof tops. The lower scale requirement of solar power also makes it much more suited to individual as well as community investment. The downside with PV, however, is that it is much less efficient and harder to scale-up than wind. Nonetheless, as existing community-owned solar projects from Bath to Brixton have shown, there is an important role for solar PV installations in contributing to our renewable energy mix whilst empowering individuals and communities to participate in electricity generation.

Three additional government measures to acknowledge the community benefit role, and differentiated legal status, of CORESCos would greatly assist in encouraging more community solar. Firstly, a new higher-rate PV FiT should be introduced solely for CORESCos. Secondly, CORESCos should become eligible for larger scale installations at a more generous level of FiT than the current 50kWh cut-off point. And finally, a mechanism should be introduced whereby suitable publicly owned buildings would be required to host solar installations on their roofs if approached by a CORESCo with a viable proposal to do so.

Steps to support localised heating projects

In addition to community production of renewable electricity, central government can also encourage the growth of micro-generated heating infrastructure, particularly in urban areas. Local authorities should be encouraged to embrace their key leadership and enabling role in this technology. Councils have a variety of built infrastructure under their direct or indirect influence, including town halls, libraries, schools, leisure centres

and housing estates, often located in close proximity in urban clusters. Connecting them together offers the potential base demand needed to make a district combined heat and power (CHP) system viable. As we have seen to date in the UK, however, very few local authorities will take the initiative on district heating projects of their own accord. Government therefore needs to use its wide range of policy, scrutiny, legal and fiscal levers to cajole and incentivise councils. As experience has shown elsewhere, once a solid core of municipalities are supplying their residents with lower-cost heating and electricity through CHP, it provides both positive role models and citizen pressure for schemes to be introduced into new areas.

Through the steps outlined above government could provide communities and individuals with incentives and entitlements that would empower, encourage and enable them to play a more active and constructive role in the production and supply of their own energy needs. The timescales and uncertainty involved in the implementation of some new renewable installations would be reduced. And a network of dispersed and innovative new entrants with a downward price influence would be encouraged into a marketplace that is currently a closed shop. This would all amount to a revolution in the relationships we have built between people and a commodity central to their everyday lives. And it would do so in a way which is truly liberal.

The size of the opportunity

What contribution could community-owned renewables realistically make to our energy needs if the appropriate incentives were provided? A comparison with market-leading Germany provides perspective. By 2010 Germany was generating 20 per cent of its total energy requirements through renewable sources, 51 per cent of which (25.5 GW) was in the ownership of individuals, communities and landowners. For wind and solar installations alone, the figure was 65 per cent. In total, over US$100 billion has been invested by German citizens in their country's renewable energy infrastructure, and with nuclear power being phased out by 2020 that figure continues to rise. In contrast, by 2012 only 3 per cent of the UK's energy was being generated from renewable sources (against a 2010 target of 10 per cent). Of that, 90 per cent is in corporate hands. On current rates we are unlikely to reach the EU 2020 target of 15 per cent of all UK energy coming from renewable sources.

The economic opportunity offered by micro-generated renewable energy should also be remembered. Birmingham City Council has estimated that £1.6 billion leak from its local economy every year via individual, public and business energy bills. For towns across Britain to retain even a fraction of the

revenue and profit they lose in that way would provide a significant boost to local economies.

We need to acknowledge that our current approach to renewables is not maximising the potential investment, and is instead increasing our reliance on gas to plug the shortfall. There is no reason why a shift in government policy could not see the UK emulate the type of figures that Germany has achieved. It is time that we genuinely empowered ordinary people and communities to take a stake in a key requirement of modern-day existence, helping the UK to reach its national renewable targets as a result.

Conclusions

As a nation we have a responsibility to ensure that our energy infrastructure is as low-carbon as possible. And as liberals we have an additional duty to ensure that it not only builds the truly devolved and empowered society that our political DNA compels us to strive for, but that we also avoid decisions which would erode and destroy agency for a generation to come. Community-Owned Renewable Energy offers the opportunity to achieve both those objectives at once.

A truly liberal response to the energy transition challenge should be to crack open our structurally un-competitive energy sector. This would provide genuine choice, agency and competition, and help drive down prices and improve service for consumers. Instead the government's current proposed solution seeks to opt largely for new nuclear and gas-fired electricity infrastructure, combined with a push for collective switching as a meek endeavour to create consumer power. This is essentially a declaration of business as usual, as collective switching will fail to deliver any genuine consumer empowerment, instead representing little more than a change in slave-owner.

Rather than destroy agency with this approach for another few decades, as liberals we should strive to do all we can to truly democratise our energy sector. This will require a completely new outlook, one which encourages and facilitates a shift away from centralised corporate production towards decentralised civic and community provision. It may prove unrealistic to provide *all* of our current energy needs solely through decentralised renewables. But it is not unrealistic to expect liberals in government to do all they can to encourage and enable individuals and communities to build agency. And by so doing, our reliance as a nation upon the Big Six oligarchy would be greatly reduced. Decisions on energy must not just be sound economically and environmentally, but must also deliver the core liberal benefit of enhanced agency for future generations.

Chapter 27

Councils, Cities and Energy Transition

Christian Vassie

While national governments, and the European Parliament, decide the legislative, urban planning, and regulatory frameworks that shape how countries move towards a low carbon future, it is at municipal level that change is and will be delivered.

The proof of this is not hard to find. Nations with more decentralised governmental structures are way in front of the UK on delivering the energy transition, and key to this difference is the power and engagement of their municipalities. In most European countries the word municipality refers not only to the local authority but also to the territory it encompasses, its resources and all the actors within it, its citizens, community groups, and businesses.

While local authorities in other nations are busy working together on exchanging best practice, too many UK local authorities are working alone and in ignorance. There are many sources of information on best practice, including Energy-Cities, which has over 1,000 member cities; and the Covenant of Mayors, which counts over 4,600 member cities. Dozens of UK local authorities are members of these organisations, including Bristol, Milton Keynes, Glasgow, Northumberland and Manchester.

The Covenant of Mayors requires its signatories to produce a Sustainable Energy Action Plan. Within these plans, published on their website, are many different and illuminating local authority approaches to reducing carbon emissions.

Energy Cities has thirty proposals for the energy transition of cities and towns, summed up in five themes: empowering local actors, knowing our territories' resources and flows, rethinking finance in general, inventing a new local governance, and urban planning as a way of reducing energy use.

The diversity of legislative, regulatory and cultural experiences of European nations, and the many different local authority structures ensure that we have access to a wide range of different models as to how the energy transition and low carbon future can be delivered.

Owning your own power station

National government must legislate to make municipalities responsible for their territories' energy supply and for knowing their territories' total energy resources and flows.

Pretending that there can exist a model of energy consumption where private power companies will work actively and independently to reduce the sales of the commodity they produce is a sham; it ignores the fact that companies exist to maximise sales and make profits. If we are serious, therefore, in stating a desire to use and produce less energy, we must radically transform the structures that own the production of energy.

In Scandinavian countries and in countries with federal systems of government, municipalities are responsible for their territories' energy supply. This contributes to developing a sense of responsibility amongst local authorities and provides a source of income, which is powering the transition to a low-carbon future. Munich in Germany, Växjö in Sweden, and Güssing in Austria, to give just three examples, all own the power stations that provide the cities with their heat and electricity.

Why is this important? It is straightforward: if you own your own power station then you benefit directly from each and every saving that you make. When new housing developments are constructed in a city that owns its own power stations it is a given that district heating will be the primary source of heating, because to do otherwise would be to waste energy and increase the city's overall energy bills. Money not wasted on energy can be spent on public transport, health, culture, etc.

Large private companies are largely not interested in heating networks, because these are local, by definition. This fundamental structural flaw, the disconnect between consumer and producer, is the reason why the United Kingdom is engaged in constructing energy-from-waste plants that are throwing billions of pounds of heat into the skies instead of providing district heating to homes, while also spending a fortune on winter fuel payments to vulnerable groups. This is barking mad.

In contrast, in Munich, municipal ownership of power stations is enabling the city of 1.4 million inhabitants to innovate. Munich is committed to switching to 100 per cent renewable energy. They are currently drilling down 5 km beneath the city to source geothermal energy, and creating new ways of harnessing summer solar heat to heat homes in winter. District heating networks transform the energy efficiency of their power stations.

Växjö, a city of 85,000 inhabitants, decided in 1996 to become fossil-fuel-free. A power company was set up bringing together the municipality and

local private companies. Växjö's carbon reduction target is 65 per cent by 2020, compared with 1993 levels, and it is committed to becoming carbon-neutral by 2030. Back in 2005, 87 per cent of its heating came from renewable energy sources. And by 2012, 51 per cent of its total energy use derived from sources such as biomass, hydro power and geothermal and solar energy. In little over a decade, emissions have been reduced by 24 per cent per person.

Güssing is the first energy self-sufficient town in Austria. Back in 1992 this small town of 4,000 inhabitants was spending nearly €6 million a year on importing energy, a price it could barely afford. By 2007 Güssing was generating 22 MWh of power a year, including an 8 MWh surplus that it sold to the grid, and had reduced carbon dioxide emissions by 93 per cent from 1995 levels.

The key driver for Güssing was the desire to keep money spent on energy closer to home. While its energy transition was initially based on wood-burning, the town has invested the revenues from its energy surplus to expand the range of renewable energy sources it uses, creating hundreds of local jobs and protecting their biomass resource, their forests.

Once a municipality is responsible for providing the heat and power consumed within its borders it will, of necessity, develop an understanding of its local renewable energy resources, consumption and energy flows – for example, identifying which companies or council operations produce waste heat and where are the potential users of that waste heat.

Identifying the local energy potential enables municipalities to quantify the difference between the resource they have and the energy they use. For example, for Litoměřice, in the Czech Republic, a spatial energy strategy identified the geothermal energy potential in their territory and it is now constructing an 18.4 GWh geothermal combined heat and power (CHP) plant that will feed a district heating network.

In 2008, the old mining town of Heerlen in the Netherlands flooded an old mine over 800m deep to heat water to 35°C. The water is used for heating purposes, and then after the heat has been extracted and the water has cooled to 17°C it is stored in other mine shafts and used as a coolant. The system provides heating and cooling to 400 new homes, 55,000m² of new tertiary buildings and 84,000 m² of existing office space, generating CO_2 emissions savings of 55 per cent.

How can the UK shift to a less centralised system? Is it possible? The great news is that we are not alone in needing to make this shift. Set against the belt of nations stretching from Scandinavia in the north, through Germany and on to Switzerland and Austria, where they have decentralised or federal

systems and where municipal power stations are the way things are done, is a second belt of nations that includes the UK, France, Spain, Portugal, Italy, and Greece, where everything is centralised.

In November 2012 France started a consultation on how to move to a more locally based approach finishing in May 2013, the consultation involves local authorities, energy supply companies, universities, trades unions, NGOs, and ESCOs (energy service companies). They are considering setting up Energy Organisation Authorities at municipal level to enable them to move towards the federal countries' model. They are also considering passing legislation so that large power companies that refuse to participate in the creation of a more local system can be excluded from the list of energy suppliers by local authorities.

Experience in Scandinavia, Germany and Austria has shown that SMEs, and larger companies with information and communications technology expertise or engineering competencies, such as Siemens, or companies involved in renewables technologies, are far more interested to expand into this field than are the old monolithic power companies. In Germany there is a growing business of companies which work with local authorities, joining with them to form arms-length local energy companies. They create a vision for energy transition, with 35 per cent of the funding coming from the private specialist company, 35 per cent coming from the local authority, and the rest coming from outside investment or long-term borrowing. These smaller companies are by their nature more flexible and perfectly happy to accept that the local authority is responsible for the strategic vision; as long as everyone is earning a return, then everything works.

The UK is not totally out in the cold either. Leicester has formed a partnership with GDF Suez to provide district heating on a twenty-five-year contract, serving 3,000 dwellings.[1] So we are already on our way.

Tackling fuel poverty

All local authorities should be responsible for ending fuel poverty in their territory.

Experience across Europe shows that entrusting municipalities with the responsibility for their energy supply is a strong lever to energy transition as it increases popular acceptance of the necessary new infrastructures, fosters creativity and innovation, and creates added economic value that remains within the territory.

Once the town of Güssing had made the decision to become energy producers in 1992, the first thing they did was to insulate all the town's buildings.

The result of the energy optimisation of all buildings in the town centre alone brought a reduction of expenditure on energy by almost 50 per cent. Only when this task was complete did they turn to producing their own power because any other approach would have required power plants twice the size they needed to be, at huge extra cost, both during construction and operation.

In Munich and Växjö, and all the other cities that own their own power stations, installing the best levels of insulation is no more than common sense. Every euro invested in insulation is recouped many times over in reduced heating bills. This directly benefits those in fuel poverty. This could happen in the UK. Many councils have run projects to provide free insulation. The benefits accrue to the householder – including those in fuel poverty – and the environment, but not to the local authority – but if the council owned its own power station, energy savings would also have been direct financial savings, making similar projects far more viable on a larger scale.

One company's waste …

Local authorities should be made responsible for promoting the circular economy within their territories and for creating a territorial bio-waste management plan.

It is not just energy flows that municipalities need to understand and manage. One company's waste is another company's raw material. Huge quantities of materials flow through municipalities: building materials, food products, fuels, waste, manufactured goods, and so on. Understanding and optimising the management of these resource flows is called industrial ecology or the circular economy. Local authorities have a key role in developing synergies between players.

In Kotka, Finland, a public-private partnership runs the energy-from-waste plant, which provides district heating and steam to a local cardboard mill. In Lemvig, Denmark, a town of 21,800 inhabitants, an anaerobic digestion biogas plant takes waste from a variety of sources to provide heat to 1,000 homes. In Barcelona, Spain (3.2 million inhabitants), a metropolitan urban waste management programme processes organic waste to produce biogas and power a CHP plant providing district heating and cooling.[2]

Smart cities and communication

Government must ensure that communication on energy transition is not left to engineers and technical experts, but also involve cultural players and the public itself. Government must require local authorities to give easy public access to real-time data on energy production.

Cities must make more use of smart metering to change energy consumption patterns, as is being done in various countries, but it is a mistake to allow only engineers and energy managers to determine the way in which energy consumption information is communicated, because experts talk effectively only to each other. The public has limited interest in kilowatt hours, volts and the like. Creative and cultural players must be involved to encourage creative and innovative ways of presenting this information, so that it is intelligible by the population.

Local authorities must be required to use smart technology to make all data on renewable energy generation, city-wide consumption, energy saving, etc. readily available and accessible to the public. There exist many models for this in cities across Europe. For example, in Heidelberg, Germany, an electronic public display board outside the city's energy department buildings, which incorporate solar PV arrays and an incinerator that provides district heating, shows the energy produced by the city's various renewable energy resources. Outside the Spittelau incinerator in Vienna, Austria, an electronic public display board not only gives information on energy production but also provides real-time data on emissions.

The public must have access to real-time information to prove that energy plants are performing as designed, to quantify energy savings and emissions and move away from a culture of secrecy and commercial confidentiality towards a culture of openness, so that people can see for themselves the cost of the decisions they make, both in financial terms and in terms of emissions.

A key obstacle to energy saving by individual consumers or businesses is the belief that their actions are irrelevant, that any good deed by them is nullified by the selfishness, laziness or ignorance of others. This state of affairs exists because any collective call to action to reduce consumption and emissions proceeds in the absence of real information.

Local authorities must make creative use of the data collected by smart meters to motivate the entire community. A campaign to require all shops to close their doors in winter, for example, could be accompanied by figures on a display screen in the city showing how much energy was being saved – not a fictional or notional computation but real data charting the impact behavioural change is having on the community's energy consumption.

Regulation

National government must deliver better regulation on emissions and be seen to be enforcing those regulations effectively. The polluter pays principle must be applied across the board.

The UK sees campaigns against each and every plan for an incinerator – but elsewhere in Europe, where the technology has been completely transformed over the past twenty years, public confidence is not an issue.[3] In 2005, for example, the German environment ministry estimated that in 2000 incinerators (of which there were sixty-six at the time) were responsible for 1 per cent of dioxin emissions in Germany, down from 33 per cent just one decade earlier. The Danish Environmental Research Institute concluded in 2006 that incinerators in Denmark were responsible for approximately 0.3 per cent of total domestic emissions of PM2.5 particulates to the atmosphere.[4] In Sweden the figures are even more dramatic; it is estimated that dioxin emissions fell by almost 99 per cent between 1985 and 2004.[5]

The European Commission's standard for the best available technology for emissions of particulates (PM1s and PM2.5s) is 1–5 mg/m^3. UK legislation authorises 10mg/m^3 (of PM10s) with peaks or continuous levels of 30mg/m^3. So incinerators in the UK are authorised to operate at 120 times the levels of emissions achieved elsewhere in the EU. This is unacceptable, rightly agitates the public, and hinders the UK's energy transition.

The UK must enact stricter and more effective regulation to ensure that only incinerators built and operated to the same standards as the best in other EU member states are allowed on UK soil.

Re-regulation of public transport

National government must give municipalities more control over public transport provision.

Another example of the need for new regulation is in the area of public transport. In Malmö, Sweden, over 42 per cent of the city's buses run on biogas. It is tempting to see this as a technological issue but, as usual, the challenges are anything but technical.

Biogas in Malmö is produced from organic waste collected from residents. By 2015 40 per cent of all household food waste will be collected by the local authority. Household sinks in Malmö have garbage disposal units built in to transform food waste into sludge which is then collected in central collection tanks before being taken by the local authority to generate biogas. New luxury apartment blocks and housing association flats alike are included in this programme. Key to ensuring the city's buses run on this biogas, however, is the fact that the city owns and controls its own bus fleet; it knows that if it creates a plant to produce biogas then that biogas will be used to power buses.

When cities across the rest of Europe invest in new tram systems it is in the context of owning the networks they are installing.

It is hard to see how a public transport system like that in the UK, where local authorities cannot even control the existence or frequency of a bus service to any given place, could ever make effective use of biogas produced from food waste collected from the inhabitants. Commercial confidentiality clauses that prevent local authorities from even knowing the passenger numbers on routes they are subsidising are counter-productive and must be changed if public transport is to grow. The deregulation of the buses was a mistake back when it happened in the 1980s. Now, as we try to create a zero-carbon future, a deregulated bus service is an anachronism that needs to be consigned to history.

Rethinking finance

All municipalities should be required to integrate future energy prices, whole-life costings and the polluter pays principle into their budget calculations and into the investment and development decisions that they make. They should be required to dedicate resources and staff to preparing this work.

A budgeting regime that takes no account of anticipated costs five or twenty years ahead cannot properly evaluate the benefits of investment in such large infrastructure projects. Constructing a tram network, for example, requires major financial investment spread over several decades. An over-powerful financial directorate that can veto spending in other council departments without itself having any expertise in the area of energy efficiency, for example, is not well placed to deliver value for money. Whole-life costings must be integrated into financial planning and council budgets.

When looking from a UK perspective at how Heidelberg, in Germany, is able to create Bahnstadt, the largest development built to passivhaus standards in Europe, the first thing to hit you is not the technical mastery of its engineers, architects, and planners, but the way in which Heidelberg solved the problem of how to redevelop the 106 hectare ex-shunting yard. A consortium including the local authority, a regional bank, and a property development company bought half the site and was able to impose a development brief rather than hope it might be adopted by someone else. Without new financial and legislative structures to enable such action to take place, many inner-city sites remain empty or fail to deliver developments that contribute to the energy transition.

In Dijon and Brest, France, a joint procurement order enabled the two cities to save €32 million, a 20 per cent saving, on their purchase of fifty-two trams. When they laid the tram rails they also installed beneath them district heating pipes. Working together and avoiding silo-thinking not only

saved the cities huge sums of money, it enabled an exchange of ideas and expertise, and reduced carbon emissions.

To undertake large projects local authorities need to know that they will get a long-term return on their investment in order to repay the loans they take out. Loan streams already exist – the European Investment Bank provided the majority of the funding for the new tram networks in Dijon and Brest, for example. The government's role is to incentivise local authorities in the UK to show the same enterprise as local authorities elsewhere by giving them control over the infrastructure that they create.

Urban planning

The creation of a sustainable low–carbon future needs to be integrated more completely into urban planning. Railway stations as city hubs. Goods delivery networks. Designing around walking and cycling.

Key drivers for change in cities should include the creation of an energy retrofitting plan for the entire building stock, having a network heating plan to inform all development within the city, ensuring that railway stations and not car parks are the hubs around which development takes place, reallocating the road network to ensure that a cycle journey is more direct than a car journey, and developing goods delivery networks within cities to reduce lorry miles.

Co-ordination between different areas of a city's master plan is vital as a way of saving money and making infrastructure improvement possible. For example, in Dijon co-ordination between departments has enabled the city's bicycle hire initiative to be relocated to the new tram stops. Data collected from the ticketing systems for both cycle hire and tram travel enables the local authority to understand how both services impact on each other, with a view to further reducing car traffic through the city.

In Barcelona, the new city planning approach identifies underground, ground level, and above ground as categories that must be considered, to improve the interconnectedness of functions and services in the city.

Local authorities should be required to ensure their strategic plans make railway stations the hubs around which shopping, buses and trams, cycle networks and cycle parking, education, and cultural and recreational facilities are designed. For several decades car parks have become the key hubs around which development is focused while development around stations has ignored their broader value to the structure of the city they serve. It is not a given that private motor cars will exist in 2050.

Designing around cycling involves more than painting dotted lines on roads. The separation of bicycle and motor traffic has been instrumental in

achieving a modal shift toward cycling in the Netherlands, Denmark, and Germany. Sometimes this is through the creation of cycle tracks, sometimes it is simply a question of reallocating street use. In Malmö, traffic lights prioritise cyclists over motorists.

Planning frameworks could require the developers of out-of-town shopping centres to contribute to the financing of tram or railway links. In-town shopping centres have problems associated with carbon emissions, noise, and pollution generated by freight deliveries. In La Rochelle, in France (population 200,000), 58 per cent of city-centre businesses use an urban distribution network based around an electric vehicle fleet.

Councils must produce a costed plan to retrofit all buildings. London is currently retrofitting 400 public buildings. In Brussels, all new construction has to be to passivhaus standard since 2010, and all renovation and refurbishment work will be by 2018. Across Europe buildings dating back to the thirteenth century and earlier are being retrofitted to reduce energy waste. If we continue, through our planning regulations, to permit a thousand different grounds for exempting buildings from the requirement to be energy efficient we are, in truth, saying that we do not care about creating a low-carbon future.

Conclusion

The suggestions in this chapter seek to put into practice principles that have been at the heart of Liberal and Liberal Democrat philosophy for decades. Giving local authorities the power and the responsibility to deliver the energy transition goes to the heart of our belief in localism. Until we face up to the massive centralisation of power under successive governments, or the culture of secrecy and commercial confidentiality that hides information from consumers and public alike, or the fundamental contradiction of expecting large businesses to be actively engaged in helping to reduce sales of the commodities they sell, we cannot begin to assemble a low-carbon future because progress is dependent on building trust, empowering all the participants, putting responsibility where it belongs, putting people and the environment above profit, and fostering a culture of innovation and openness.

The proposals in this chapter should not be read as anti-business. Those nations in which municipalities operate their own power stations, for example, work with business to deliver energy to their customers. They are free to sell power to the grid, like any other power company. This approach makes money as well as reducing energy waste, making better use of local resources and cutting carbon emissions, so fears about the cost of such a shift are

totally unfounded. The issue is rather one of who should be in ultimate control if we are to succeed in our ambition to create a low-carbon future for our nation – bodies ultimately answerable to shareholders and the generation of profit, or bodies ultimately answerable to the common good? The answer, surely, is obvious.

Notes

1 Leicester District Energy, *Delivering Low-Carbon Energy* (November 2012).
2 See http://ecoparcbcn.com/
3 Dr Dick van Steenis, Waste and incineration, Oral evidence to the Welsh Assembly, 2 July 2012; http://www.senedd.assemblywales.org/documents/s8650/Dr per cent20van per cent20Steenis per cent20to per cent20Committee.html?CT=2
4 Malene Nielsen, Jytte Boll Hillerup, Christian Lange Fogh and Lars Peter Hansen, *PM Emission from CHP Plants* < 25 MW_e (National Environmental Research Institute of Denmark).
5 Swedish Environmental Protection Agency, *A Strategy for Sustainable Waste Management, Sweden's Waste Plan* (2005).

Chapter 28

Community Policies for a Low-Carbon Future

Louise Bloom

Local councils and local communities are well placed to help build a low-carbon future. Councils, whatever their size, are able to use their influence and budgets to create low-carbon economies in their own areas. Local communities are similarly placed to examine local solutions to a global problem. But there are barriers that need to be overcome in order to do this, both real and perceived; the latter are sometimes hardest to deal with. National government at times seems to set out to stifle local councils and communities of their desire to provide local solutions. The media can also be an enemy of innovation, as can those only too willing to play unnecessary party politics.

I want to illustrate what local communities can do and are doing to take action to create low-carbon economies, examine the barriers that are put in their way, discuss how to overcome those barriers and suggest further opportunities that can be explored to further expand those local low-carbon economies. The maxim 'think globally, act locally' has never been more relevant.

Community projects can be both large and small. To take two examples, the villagers of Woolsery in Devon decided to rebuild their village hall and make it a truly sustainable building generating its own energy and selling surplus energy to the national grid; while the Westmill Wind Farm Co-operative in Oxfordshire now generates enough energy to power over 3,600 homes a year and raise over £1 million in income.

Woolsery, with a population of 1,200, decided it wanted to update its village hall to create a warm, inviting and sustainable building that would be an asset for years to come. A charity was set up to oversee the project with a committee of twenty volunteers. The village was fortunate enough to secure funding to completely rebuild the village hall, so started off by fully insulating the new building, installing underfloor heating, rainwater harvesting to flush the toilets and south-facing windows to maximise sunlight.

As the building was in a windy location they next explored installing a wind turbine, then considered using the area's high level of sunshine and, finally, a ground-source heat pump. The volunteers were assisted by Devon County Council's renewable energy advisers who were a great source of advice, assistance and technical information in planning the project. By utilising various grants available, the villagers were able to complete the 'virtuous circle' of wind, sun and earth and generate electricity for the hall from a 6 kW wind turbine, 9 kW of solar photovoltaic (PV) panels and an 8 kW ground-source heat pump.

So now the village hall generates its own electricity and also sells the surplus back to the grid; the balance varies according to the energy needs of the hall at any one time and the amount of energy being generated. Nearly 13 tonnes of carbon are saved each year. After offsetting costs against income and bill savings, the running costs of the hall have come down by ninety per cent. This in turn means that village groups can be charged a low rent for hiring the building so the community really does benefit in every way. It also has many bookings now from people who want to use it as a learning resource, an 'eco hall'. Many people stop to look at the information panel that shows the energy being generated at any time.

Although the costs of £82,000 were covered by grants, if they had not been, and had the project only benefited from the feed-in tariffs scheme, the payback on the original investment would still only be around ten years. Even without the FiTs, the original estimate of twenty-two years would still make it a good deal.

For a scheme like this to work, a pool of volunteers with the time and commitment to see it through is vital, as is technical advice and support; councils can be a good source of such advice and support, as can local energy advice centres. Engagement with the local community is also vital to ensure support and make sure that any concerns can be dealt with and not get tangled up in the planning system. The Woolsery Village Hall committee was successfully able to do this, which meant there were no unnecessary delays to the project. Many local halls are run by groups of volunteers so this example of a really local low-carbon economy could be easily replicated elsewhere, even without the Devon sunshine.

It was the open, flat and windy landscape of Oxfordshire that caused farmer Dan Twine to think that he had a good location for a wind farm similar to those he had seen in Denmark, where 20 per cent of the country's renewable generators are owned by communities. He created the Westmill Wind Farm Co-operative, the first wind farm in the UK to be community-owned from

commissioning. Nearly 2,500 people signed up to the original proposition of buying shares in five large wind turbines. After ten years of planning and other battles, the co-operative now generates an annual income of around £1 million and 12 million kWh of energy, enough to power 3,500 homes a year, with an annual carbon saving of 6,500 tonnes.

Funding for this substantial project came from the shareholders, who are a mixture of local people and other investors, and a bank loan from the Co-Op Bank, who also managed the share issue. When the share issue was oversubscribed, priority was given to people who lived within a fifty-mile radius of the site; they received all the shares they requested, while those who lived further away had their allocation reduced.

The co-operative that now runs Westmill, largely on a voluntary basis, set up a charity, the Westmill Sustainable Energy Trust, to further support the local community and economy with energy-saving projects, such as paying for insulation for local community buildings. The fund, with the help of the wind, generates £5,000 – £6,000 a year. A new addition to the site is 82 ha of solar PV, generating around 4.4 GWh of energy per year. This time there were no planning battles, perhaps showing how much public perception of such projects has moved on.

This may sound like a massive project, but it was inspired by one man, who admittedly happened to own a farm, and was carried forward by local people committed to the scheme, both in terms of funding and time dedicated to it, including overcoming opposition.

Local councils have a key role to play as community leaders and funders of the local low-carbon economy. With imagination and political will, councils of any size can tackle climate change and reduce their own carbon emissions, as well as taking action to reduce emissions amongst the wider community.

Spreading best practice and sharing expertise is vital, as encouraged by the Local Government Association and the now-abolished Beacon Council scheme. Unfortunately councils' approach to this can be patchy, but in the current economic climate it also makes good financial sense for councils to talk to each other about carbon savings.

Eastleigh Borough Council in Hampshire (winner of Beacon Council for Tackling Climate Change in 2008–09) is a medium-sized district council with a population of 125,000. Sustainability and tackling climate change has been a long-term commitment of the governing Liberal Democrat group, and it has embraced the use of renewable technologies as a way of taking this forward. Over the last year or so the council has installed nearly 700 PV panels on ten buildings it owns, including 288 on a leisure centre, one of the

largest schemes in the south of England. The total energy generated so far is around 170,000 kWh, enough to power fifty-one family homes for a year. The annual carbon savings over twelve months are around 90 tonnes, far exceeding expectations. The council has invested £650,000, for which it expects an income of £2 million over the lifetime of all the schemes. The council can use this income for the benefit of the local community to keep the council tax low and invest further in the low-carbon economy for, by example, supporting public transport and providing funding for its home insulation programme.

`At the other end of the scale, Bristol City Council with a population of 430,000, has invested £6 million, some of it European Union funding, in solar panels, biomass boilers and wind turbines. Three 6 MW turbines at the port of Avonmouth now generate 15 GWh of energy a year, enough to power nearly 5,000 family homes and saving nearly 15,500 tonnes of carbon.

Bristol has also received £2.25 million of European funding towards the costs involved in setting up an Energy Service Company, or ESCO, and a huge investment programme. An ESCO can be a good way for councils to trade, enabling them to invest in energy-saving projects and infrastructure at arms length from other council business. They can sell energy generated through the ESCO, again keeping it separate from the usual local authority income and expenditure balance sheets. The ESCO set up by Bristol City Council will fund projects worth up to £140 million and create at least 1,000 jobs. It will also lead to increased energy efficiency and lower fuel bills for thousands of residents.

Many of the schemes proposed by Liberal Democrat-run Bristol City Council were opposed by both the Conservative and Labour groups on the council. It took strong political leadership and commitment to the principle of establishing a low-carbon economy that led to Bristol now having the lowest carbon emissions of any major UK city. A 'green thread' has run through Liberal Democrat councils, and party policy, for many years in a way that is not true of the Conservative and Labour parties.

Councils can also work together to create low-carbon economies across larger areas than individual council areas. With political will, they do not have to be of the same parties. Home insulation has to be a national priority; 13 per cent of the UK's CO_2 emissions are derived from the energy used to heat homes, much of which is wasted. Department of Energy and Climate Change (DECC) figures show that up to 12 million homes could benefit from better insulation, which would in turn create up to 225,000 new jobs.

The Insulate Hampshire project, which lasted eighteen months and has recently concluded, was supported by all eleven of Hampshire's

district councils and Hampshire County Council, comprising both Liberal Democrat and Conservative authorities. Government money for household energy efficiency programmes, and Scottish Power, under the CERT (Carbon Emissions Reduction Target) programme, provided funding for the scheme. It offered professionally installed cavity wall and loft insulation free of charge to Hampshire home-owners and privately renting tenants (with the landlord's permission), where the property qualified (i.e. two-thirds or more of the loft and/or cavity had to be available and suitable for insulation) and where there was less than 60 mm of loft insulation. All applications were subject to a free no-obligation technical survey. Savings for residents can be up to £300 a year if both cavity wall and loft insulation are carried out.

The County Council, in conjunction with the district councils, organised community DIY insulation events across the county, where residents could collect rolls of loft insulation to top up their own existing insulation. Information on energy saving and other council services on offer were also available at these events. Many of these were organised successfully by local community groups. All the councils involved ran their own publicity and information campaigns for the scheme to try to reach as many people as possible, targeting those households most likely to benefit. Town and parish council offices and notice boards worked particularly well in the more rural areas of Hampshire. In Eastleigh the scheme was supported and promoted by the Mayor of Eastleigh on leaflets and posters to help provide reassurance and credibility to residents. The Mayor's picture, in full robes and regalia, gave an added dimension to the promotion! Monthly reports with league tables were produced to try to encourage competition between councils to spur on their efforts in the publicity campaigns.

By the end of September 2012, over 15,000 insulation measures had been installed across the county, resulting in over £1.8 million of fuel bill savings for residents in the first year. A total of 210 information and advice events had been held, and more than twenty community DIY events where nearly 800 householders took away nearly 100,000 m^2 of insulation. Now that the project has finished, the partners are discussing if it would be possible to continue with the Insulate Hampshire brand and processes for other energy-saving initiatives across the county, possibly utilising the Green Deal. The project showed that districts and the county would work well together; sharing publicity saved costs and created the brand image; the website proved a popular way of accessing information; using town and parish councils to publicise the scheme helped reach a wider range of people; the league table encouraged competition between councils; and the community events were very successful.

The coalition government's major initiative in this area, started by the Liberal Democrat former Secretary of State for Energy and Climate Change Chris Huhne, and now being driven ahead by his successor Edward Davey, is the Green Deal, the proposed solution to the problem of a lack of investment in energy-saving measures in homes and non-domestic buildings. The Green Deal will provide finance to fund improvements to the energy efficiency of properties, with no upfront charge to the home-owner; the costs of the installation will be paid back through the lower bills that will result. The Green Deal is available to owner-occupiers, the private and social rented sectors and the commercial sector funded by local authorities, housing associations or ESCOs or any combination. Additional financial support will be available, through the new Energy Company Obligation (ECO), for low-income households with the lowest incomes and hard-to-treat properties, for example those with solid rather than cavity walls.

Local councils, groups of town and parish councils and other very locally based community organisations have the potential to play a major role in delivering the Green Deal, working with other partners such as housing associations. As well as the direct benefits to residents in terms of lower energy bills and carbon emissions, and less fuel poverty, jobs will also be created locally. Councils will be able to encourage the use of local businesses as suppliers, provide advice and signpost residents to bona fide companies.

Some councils are looking at working together to provide a single offer for the Green Deal, benefiting from economies of scale. Both Green Deal providers (the installation companies) and the potential providers of private finance are more likely to be interested in larger population areas. For example, the councils in the Partnership for Urban South Hampshire (PUSH) are currently considering working together in delivering the Green Deal; as well as its target of reducing carbon emissions, the Green Deal will enable PUSH to further its economic ambitions for the sub-region, generating jobs and economic activity, a true model for the local low-carbon economy. Housing associations in the PUSH area are also being encouraged and supported by councils to get involved. Measures taken to improve energy efficiency in poorly performing blocks of flats could include changing heating systems as well as improving internal and external insulation and fitting solar PV panels. Partnership support to provide advice and information is also being accessed through community-based groups such as GroundWorks and voluntary sector energy advice centres.

The Green Deal will not be straightforward to implement. Not only is the process complicated, energy efficiency can be a difficult message to promote.

The experience with Insulate Hampshire was that many people simply did not believe that they were being offered something for free that would save them money, even when badged as being on offer from their local council. When the offer was explained to people face to face, such as at the community events, however, it was easier to convince people that it was a genuinely good deal.

Thinking more widely, the way communities are built and the way we all live needs to change to ensure a low-carbon future. Most of us travel to work, to the shops and to leisure facilities, and our children are driven to school. Local communities are not truly local, as the facilities and services we need are so spread out. Public transport is not good in many areas of the country, particularly outside major urban areas, so most of us use cars as our primary means of transport.

Eco Towns were briefly seen as a way to solve the issue of how and where we live, but none of the proposed sites have yet been built. Some, for example Borden in Hampshire and North West Bicester in Oxfordshire, still exist in their local authorities' housing allocation numbers and it is hoped they will be built to the original sustainable and low-carbon ideals, but this is by no means certain following a 50 per cent cut in the government budget to support local infrastructure. The concept was never popular, partly because some of the sites were those already rejected through local planning processes, but also as they were seen to be a solution imposed by central government. Even many green campaign groups, such as the Campaign for the Protection of Rural England, did not support them, arguing that many of the sites chosen were unsuitable and that all towns need to be sustainable, not just certain exemplar towns.

There is always a tension between what different groups of people want, what the government wants and what the country really needs to achieve a low-carbon future. In the cases I have illustrated where individuals, communities and councils have taken action to tackle climate change, it has generally been due to the personal or collective commitment and drive of those involved. Where groups of councils have come together it is not necessarily because all members believe in the environmental ideal; the motivation could be a desire to create local jobs, to be seen to 'do the right thing' or purely because everyone else is doing it. Local people buying into community-based renewable energy schemes again sometimes have little interest in the principle, but simply see it as a good investment. I have long believed that it is not necessary to convince everyone of the fact that climate change is man-made to persuade people of the need to work towards a low-carbon economy; for many people the economic argument is enough.

The Climate Change Act 2008 commits the UK to reduce its greenhouse gas emissions, but the requirements apply to central government only. Some people argue that legislation is needed to force local councils to take action on waste and recycling, planning, transport, housing, employment policies and open-space policies to achieve the cuts in carbon emissions we need. Others see this as a move towards yet more centralisation, the kind of society that many of us would not want to live in. Ideally, local decisions need to be taken locally, with local politicians being answerable to their residents. I suggest that a refocusing is needed, in discussion with local authorities and communities, with a combination of carrots and sticks to achieve the carbon reduction targets already legislated for.

Ultimately, however, climate change is too big an issue to leave for politicans to argue about who is responsible for what. So I would like to see a future Liberal Democrat government willing to legislate where necessary; for example, introducing binding local targets to ensure that all local councils, not just those strongly committed to reducing carbon, took their responsibilities seriously. Rewards could come in the form of extra funding, similar to the New Homes Bonus that councils receive based on levels of housing development.

Another barrier to overcome is that many people only take a short-term view of solutions when a long-term look is needed. For example, when building new housing developments, transport infrastructure needs to be built first, not last. This may mean that a transport system runs half-empty in its early years, while the housing is constructed, but it will also mean that as people move in they will see that the need for a car is drastically reduced or even removed.

This does not seem to be so much of a problem elsewhere in Europe. For example, when the German town of Freiburg was rebuilt as an exemplar of an eco-town, all the infrastructure went in first. It was acknowledged that it could take up to twenty-five years for the town to fully develop and for all the cost savings to be achieved, but carbon savings would be realised very early on.

A low-carbon future where we all live sustainable lives is perfectly possible, looking at the many examples of good practice that already exist, but they are not widespread. Local councils and communities need to buy into the ideals and practicalities of what can be achieved and how to achieve it, and, yes, costs and lifestyle choices do need to be made. A very simple example of this is car clubs. Instead of everyone owning their own car, vehicles of varying size are communially owned, costs shared and cars are offered as a bookable service to all members of the club. Booking can be made by the

hour, half-day or day. This can also work for commercial organisations in the form of pool cars. IKEA have a pool car scheme as does Eastleigh Borough Council; indeed the Eastleigh scheme was so successsful that a third car was recently bought to add to the original two. Some compromise and forward planning is needed to make the schemes successful, but both carbon and cash can be saved by members.

A future Liberal Democrat government needs to make a real commitment to properly funding the measures that are necessary to achieve carbon reduction targets, recognise how important the green economy is and provide leadership in the way that some councils already do. It is no good sending out the mixed messages we get from the current government, who claim to want to be the 'greenest government ever', but then refuse to provide the funds, legislation and leadership needed to make this a reality. The local successes I have discussed here need to be the rule, not the exception, if we are to achieve the low-carbon future that climate change demands.

Chapter 29

Adapting to Climate Change

Paul Burall

Our climate is destined to change significantly even if substantial mitigation measures are put in place soon. The *UK Climate Projections* published by Defra in 2009 suggest that even if the global temperature increase is constrained to 2°C, temperatures in the south of England could see a rise of 3°C by the 2080s, and an average summer temperature rise of 5°C in the south west of England is possible.[1] Even moderate temperature rises will have significant effects on health, infrastructure, food and water supply and biodiversity, as well as introducing new risks for businesses and the economy.

The UK recognised these facts when, by passing the Climate Change Act in 2008, it became the first country in the world to have a legally binding long-term framework to deal both with mitigating climate change and adapting to the inevitable consequences. The preparation of the climate change risk assessment required by the Act was fulfilled at the beginning of 2012, and will be followed by a national adaptation programme in 2013. This chapter looks at some of the adaptation measures that may be required.

Of course, the UK cannot ignore the effects of climate change on other parts of the world: the repercussions will be felt everywhere. All coastal countries will be more vulnerable to flooding due to sea level rise, with around 50 million additional people placed at risk. The production of staple food crops is likely to decline in countries as far apart as India, Brazil, the US and Russia. Water resources in particular will be stretched, with parts of Italy, France and the US especially vulnerable. It is no wonder that John Beddington, the Government Chief Scientist, has forecast a 'perfect storm' of food shortages, scarce water and insufficient energy resources that threatens to unleash public unrest, cross-border conflicts and mass migration as people flee from the worst-affected regions.[2]

Food and agriculture

The food issue well illustrates the challenges and international ramifications for policy-makers in the United Kingdom. Professor Tim Benton, the Global

Food Security Programme's 'champion', in 2011 pointed out the vast scale of the challenge: the global population is expected to increase by 35 per cent by 2050 with the demand for food rising by 70 per cent.[3] Yet there is no more unused land available for cultivation, climate change threatens to reduce crop yields, and there will be increased competition both for land and water for uses other than food production.

Benton believes that the 'admirable ideals' of self-sufficiency and organic growing would only reduce yields from productive land: 'We are not self-sufficient in Europe, so if we increase organic production our yields will go down and we will need to import more food and will be asking someone else to produce our food for us … We would be exporting the environmental cost and someone else will be paying for it.' Instead, he suggests that the UK needs to maximise its food production and that managing intensively farmed land alongside non-cropped plots would allow maximum production while maintaining the environment for wildlife and biodiversity. He sees a role for genetically modified (GM) food technologies and for chemical innovations but also wants action to reduce food wastage, stop over-consumption, manage soil better, and farm more efficiently in a system that he describes as 'sustainable intensification'.

Soil management is particularly important, both to prevent loss and retain fertility; more than two million tonnes of topsoil is lost every year in the UK due to erosion by wind and rain, and agricultural land has been consistently degraded over the years by poor land management. These losses can be reduced by measures such as changes to agricultural practices and the planting of hedges and trees to minimise wind and water erosion.

Soil is also a major carbon sink and the evidence is that in recent years it has had a substantial impact on climate change-inducing carbon emissions, not least from the exploitation of peatlands. So, for the benefit both of plant fertility and carbon retention, soil management needs to become a priority, both in terms of preventing activities that emit carbon and by enhancing agricultural practices to increase the organic content of soil.

Lester Brown, President of the Earth Policy Institute in Washington and author of *Full Planet, Empty Plates*, also predicts a food crisis.[4] He is particularly concerned about water and climate change: 'We live in a world where more than half the people live in countries with food bubbles based on farmers' over-pumping and draining aquifers. The question is not whether these bubbles will burst, but when … Why can't politicians understand that every 1°C above the optimum in the growing season equates to roughly a 10 per cent decline in grain yields?' He believes that the crisis can only be averted by

saving water, eating less meat, stopping soil erosion, controlling populations and changing the energy economy.

The UN Food and Agriculture Organisation (FAO) is no less alarmed, warning of 'potentially catastrophic' impacts on food production from climate change and demanding that 'Within the global adaptation architecture greater space be given to the risks linked to slow-onset impacts of climate change, particularly food security risks'.[5] The FAO wants plant genetic material stored in gene banks to be screened with future requirements in mind; additional plant genetic resources – including those from wild relatives of food crops – to be collected to avoid their disappearance; and the breeding of climate-adapted crops such as varieties of major cereals that are resistant to heat, drought, submergence and salty water.

The Climate Change Risk Assessment (CCRA) published by Defra at the beginning of 2012 highlights how UK agriculture may be significantly affected by climate change.[6] Rising temperatures and changing rainfall patterns, changes in sunshine levels and in concentrations of atmospheric carbon dioxide and increasing frequency of weather events currently considered extreme would all have an impact on the sector. The CCRA suggests that mitigation responses should include water harvesting and on-farm storage, combined with irrigation techniques that improve water efficiency; using deep-rooting or drought-tolerant grassland species; changes in livestock production cycles such as autumn lambing and calving; and the planting of trees to provide shade for livestock and windbreaks for crops.

Taking food production off the land also has potential. One example is a three-storey fish and vegetable farm housed in a converted meat packing factory in Chicago, where the plants are grown hydroponically in water fertilised by the fish waste, thus cleaning it in the process so that it can be returned to the fish. Organic waste is used to produce methane for the factory's combined heat and power plant. The magazine *Businessweek* has forecast that such high-rise horticulture will be one of the top twenty businesses of the future.[7]

Meat production accounts for at least 15 per cent of all global warming emissions and is also a prime driver of deforestation. One extreme way of tackling this has been demonstrated by researchers at Maastricht University who have already produced muscle-like strips grown from real animal cells that have the same constitution as real muscle,[8] Factory-produced cultured meat would have major environmental benefits. Hanna Tuomisto of the University of Oxford has calculated that cultured meat would require just 1 per cent of the land needed to produce the equivalent amount of conventional beef and that greenhouse gas emissions would fall to around 4 per cent of global emissions.[9]

Globally, climate change may have little effect on total food production, as some parts of the world are likely to become more productive, counterbalancing losses elsewhere. But the challenge of feeding billions more people requires urgent action.

Rising temperatures

While UK food security depends as much on actions elsewhere in the world as here, the same is not true for many of the other challenges of adapting to climate change. One example is the need to adapt British cities to rising temperatures. The CCRA suggests that, even if greenhouse gas emissions are stabilised to constrain the average temperature rise to 2°C, by 2050 the number of days a year when the temperature exceeds 26°C in London will increase from the current 27 to more than 120.

Rising temperatures in urban areas are exacerbated by the heat island effect, which has been found to increase night-time temperatures in London by up to 9°C, in Manchester by between 5°C and 10°C and in Birmingham by between 5°C and 7°C. So mitigation policies are essential to minimise health problems, heat-related deaths and demand for air conditioning, this last leading to an increase in energy consumption and carbon emissions that will outweigh reduced demand due to less cold winters; air conditioning also adds to the heat island effect as it simply moves heat from buildings to the air outside.

The CCRA identifies the need for green space and 'blue' space (ponds and rivers) in towns and cities as a key mitigating factor to provide cooling and to counter the heat island effect, as well as providing a refuge where people can find respite from the heat. The effectiveness of greenery in moderating the heat island effect has been demonstrated by two projects funded by the Engineering and Physical Sciences Research Council. The SCORCHIO project showed that maximum surface temperatures in woodland areas within Manchester were 12.8°C cooler than town centre areas, and the night-time differential was up to 10°C. Adding 10 per cent green cover to the town centre or to high-density residential areas could result in a cooling impact of around 2.5°C; conversely, removing 10 per cent of green cover would result in a temperature rise of up to 8°C.[10] The LUCID project developed a city-scale urban climate model based on the urban heat island effect in London and confirmed that, in cities in general, the urban heat island effect requires extensive greening to achieve a significant reduction in temperature.[11]

Trees – in particular, large trees – are the key to reducing urban temperatures through shading and by cooling through evapotranspiration; grassed

areas lose their evaporative cooling function fairly quickly in a drought. The CCRA calls for planners to pay particular attention to vulnerable locations, such as hospitals and care homes and socially disadvantaged areas, which typically having the least urban green space.

Mitigating the effects of climate change demands a new approach to building design, with as much emphasis on keeping them cool in summer as on keeping them warm in winter. The first objective should be to maximise passive cooling and minimise air conditioning; the CCRA suggests that, otherwise, cooling demand in, for example, London, could increase by 50 per cent by 2030 compared with 2004. Measures to be considered should include reflective external surfaces, including white roofs to minimise heat absorption and the heat island effect; external blinds and shutters; and the use of green roofs and other planting to reduce temperatures through transpiration.

Water, droughts and floods

The expected increase in the frequency and severity of droughts and rainfall also require mitigation. Water conservation and on-site water recycling will be essential, as will be the avoidance of impervious hard surfaces that increase the risk of flooding during periods of high rainfall.

Nationally, water is one of the most critical climate change issues; the CCRA forecasts a fall in the public water supply of up to 35 per cent by the 2080s, with the number of people living in areas with a likely water deficit being between 27 million and 59 million by the 2050s. The temptation is to deal with this with grandiose projects such as desalination or a national water grid. But these kind of solutions will dramatically increase the cost of water and require substantial energy to power them, simply adding to climate change. So priority should be given to water conservation, including universal metering so that everyone pays for what they use; an increase in local and sub-regional storage capacity; and moves towards closed-loop water systems for industry.

There is also a need to ensure the resilience of sewerage plants, both to protect their power supplies during severe weather and to ensure that rainfall run-off is not added to polluted water that requires treatment.

The CCRA forecasts that up to 5 million people could be exposed to a significant likelihood of flooding by the 2080s, compared with fewer than a million now. The Environment Agency has warned that much more needs to be done to ensure that farmland drainage schemes and the poor design of new-build developments do not exacerbate flood risk, which is becoming as frequent in summer as in winter. The design of sustainable drainage schemes

needs further study to ensure that they can cope with the extreme conditions that climate change is making more likely.

The House of Commons Public Accounts Committee has estimated that 5 million homes are already in danger of flooding, at a cost of £1.1 billion a year; Defra has forecast that flooding caused by climate change could eventually cost up to £12 billion a year. In 2009, the Environment Agency warned that its flood budget needed to be increased by 9 per cent to maintain levels of protection. So it is surprising that the government has cut the flood defence budget by 10 per cent. It is clear that investment in flood defences must be increased if major financial losses and much human misery is to be avoided in the future. There is also a need to ensure that developments in areas at any risk of flooding are designed to minimise damage by, for example, routing ground floor electricity cabling down from the ceiling rather than up from the floor.

Infrastructure at risk

Water supply and flood prevention are not the only infrastructure requiring rethinking in the light of climate change; transport networks are also vulnerable to high temperatures and heavy rainfall. There is a need to review the rail infrastructure to reduce the risk of rails buckling due to high temperatures and to design out the risk of rain-induced mudslides, landslips and erosion damaging tracks. The road infrastructure is similarly at risk.

The energy infrastructure can also be vulnerable: the CCRA suggests that up to 25 GW of generating capacity (30 per cent of the current total) will be vulnerable to significant flooding by 2080. Substations and other components of the electricity distribution system are also vulnerable.

With increasing interdependency between countries, it is also worth noting some other risks. For example, most French nuclear power stations are cooled with water that is extracted from and returned to rivers; there have already been cases where power stations have been shut because the return temperature of the water exceeded 24°C, the limit beyond which river ecology would be damaged. So there is a strong case for developing energy storage systems to counter such interruptions, as well as balance out intermittent renewable sources.

The future of coastal nuclear power stations in particular needs rethinking; as the 2012 PwC Low Carbon Economy Index warned: 'Any investments in long-term assets or infrastructure, particularly in coastal or low-lying regions, need to address far more pessimistic scenarios'.[12] The PwC report warns that 'Businesses, governments and communities across the world need to plan for a warming world – not just 2°C, but 4°C, or even 6°C'.

Economic impacts

Another leading company warning of the economic dangers of climate change is Munich Re, the world's largest reinsurance company. It has pointed out that, already, the number of weather-related loss events in North America have nearly quintupled in the past three decades. In Asia, the increase has been fourfold, with significant increases everywhere else too. This is already raising insurance premiums significantly. Munich Re has called for investment in better risk modelling capabilities as well as such adaptation measures as tighter building regulations and better flood management.[13] But the insurance industry should go further and research how it can pump some of its investment funds into adaptation measures; this could benefit the industry both by direct financial returns in, for example, improving water resources, and by reducing some of the risks exacerbated by climate change.

In November 2012, an alliance of 200 investment institutions controlling US$21 trillion of assets worldwide warned of the damage that climate change could inflict on the global economy. Spokesman Chris Davis pointed to superstorm Sandy, which had devastated parts of New York the previous month, as being: 'Typical of what we can expect if no action is taken and warming trends continue. Investors are rightly concerned about the short- and long-term economic risks of climate change and understand that ambitious climate and clean energy policies are urgently needed to avoid catastrophic impact.'[14]

Without mitigation, the costs of climate change to the world economy are likely to be immense: in 2006, the World Bank put the cost at between US$9 billion and US$41 billion a year, not very different to the estimate in the Stern Review (*The Economics of Climate Change*) published the same year. Early adaptation action can significantly reduce the economic risks, especially by ensuring that new infrastructure spending takes account of future climate change and that sufficient is spent where necessary on adapting existing infrastructure. In 2011, the Royal Academy of Engineering pointed out that such investment 'Will reduce the risk of economic disruption to the country and enable the opportunities from well-adapted infrastructure to be maximised'.[15] And in 2012 Defra pointed out that the annual demand for economic infrastructure investment in the UK is expected to be in the range of £40 billion – £50 billion until at least 2030, going on to say that: 'We need to ensure that large investments take account of future risks from climate change'.[16]

Biodiversity

Biodiversity is also at risk from climate change and it is clear that current policies are inadequate to minimise losses. Natural adaptation – allowing

plants and species to migrate to more suitable areas as conditions change – is hindered both by inadequate and somewhat haphazard protected wildlife networks that inhibit migration and by many designated protected sites being too small to be effective. There is also a need to plan for the creation of suitable replacement habitats for those lost either to development or to the consequences of climate change. Planning authorities should have a duty to ensure that these requirements are met, that plans are coordinated with neighbouring authorities, and that new sites are independently evaluated to ensure that they will be effective.

Conclusions

Finally, the CCRA has pointed out that there are many areas where gaps in knowledge currently limit our understanding of potential climate change impacts and adaptation actions; there is a lack of clear evidence about everything from the environmental impacts of drought to the potential impacts of ocean acidification. So there is an urgent need for more research to ensure that we really do understand the potential impacts of climate change so that evidenced adaptation measures can be put in place in time to protect us from what otherwise are likely to be very unpleasant consequences.

Significant changes to the global climate are inevitable, irrespective of what mitigation measures are taken in the future. And the longer we wait for effective mitigation, the more severe the effects of climate change will be. So planning to adapt to climate change is now critical – both to ensure that what we are building now can cope with a changing climate and to minimise the economic risks. The longer we put off the necessary action and investment, the greater the risks to human welfare and the higher the long-term cost to the economy.

Notes

1 See ukclimateprojections.defra.gov.uk
2 Speech by John Beddington at the Sustainable Development UK conference, 19 March 2009.
3 Speech by Professor Tim Benton to the East of England Co-operative Society, October 2012.
4 Lester Brown, *Full Planet, Empty Plates* (Earth Policy Institute, 2012).
5 FAO, 'Climate Change and Food Security', submission to the UN Framework Convention on Climate Change, 2009.

6 Available at http://www.defra.gov.uk/environment/climate/government/risk-assessment/
7 *Businessweek* 4 November, 2010.
8 Andy Coghlan, 'Meat without slaughter', *New Scientist*, 31 August 2011.
9 'Meat without slaughter', *New Scientist*, 31 August 2011.
10 See http://www.sed.manchester.ac.uk/research/cure/research/scorchio/
11 See http://www.arcc-cn.org.uk/project-summaries/completed-projects/lucid/lucid-outputs/
12 Available at http://www.pwc.co.uk/sustainability-climate-change/publications/low-carbon-economy-index.jhtml
13 http://www.munichre.com/en/media_relations/press_releases/2012/2012_10_17_press_release.aspx
14 Open letter to world government leaders from Ceres (US-based coalition of investors and green groups), 20 November 2012.
15 Royal Academy of Engineering, *Engineering the Future* (2011).
16 See http://www.defra.gov.uk/environment/climate/adapting/