industry will be placed inside the EU emissions trading scheme, but the looseness of the cap may mean that the growth of aviation will be barely constrained at all.

Attempts to restrict particular activities with severe impacts on carbon dioxide emissions run into similar problems. The manufacture of aluminium is one of the most energy-intensive industrial processes; but when the German government tried to restrict the use of metal drinks cans, it faced action from the European Commission.[13] The European court eventually ruled that trying to ban the use of cans that were freely available in other member states was a restriction on trade within the EU and was therefore illegal. Any action by an individual country within the EU that tried to weight consumers' choices towards less polluting alternatives would probably suffer a similar fate.

And it is not simply the strong bias in the world economic system towards free trade that makes action by individual countries difficult. Increasingly, we see that one environmental objective can sometimes get in the way of another. For example, reducing emissions of diesel particulates from buses gives the bus operator lower fuel economy.[14] Understandably, society also wants to give consideration to the impact on human health of poor air quality in city centres, so a trade-off is made between carbon dioxide emissions and the particulates from buses that may be causing increased levels of respiratory diseases such as asthma. Governments cannot give overwhelming priority to climate change mitigation without affecting its achievement of other targets.

Similarly, determined opposition from small groups of highly motivated protestors can delay or stop many initiatives to reduce emissions. The most obvious examples come from the experience of wind power developers. Wind farms take many years to get through planning processes and then face a further delay in the queue for connection to the national grid. Another illustration is the huge upgrade to the power lines in the north of Scotland to meet the increased need for the transmission of wind-generated electricity to consumers. Scotland's wind resources probably account for one-quarter of the total wind energy of the EU. Despite the active encouragement of wind farms by government, objectors worked assiduously to secure the refusal of planning permission for the pylons across beautiful countryside. Unless this decision is overturned, wind development in the region will be strictly curtailed. Without doubt the objectors have strong points – some of Scotland's best views would be affected by the new transmission line. Caught between those vociferously protecting something they hold dear, and the weaker and less organized forces arguing for measures to protect the global atmosphere, the protesters will always tend to carry more weight.

By deciding to take action to reduce your own emissions you are providing important background support for those who are working to remove the obstacles to the development of wind and other renewables. The unrestrained growth in air travel is perhaps the most intractable climate challenge facing governments. Although air travel is only responsible for less than 6 per cent of UK emissions at present, the amount of carbon dioxide pushed out by jet engines will probably double within 25 years.[15] And the side effects of airline

emissions (dealt with in Chapter 9) make the position far worse. While we are struggling to generate the most modest of decreases in surface emissions of carbon dioxide, international air travel – untrammelled by controls imposed by Kyoto processes – races away and overwhelms any improvements we see in other fields. It is no good the government asking us to switch off our televisions when not in use (saving about 30kg of carbon dioxide a year) while waving us cheerfully away on our shopping trips to New York (over 2.5 tonnes of greenhouse gases per trip, or almost 100 times as much).

Statements by the government on air travel are invariably two sided. First, the administration gives a welcome to the impact of low fares, cheap carriers and better access to a huge range of destinations. If political success is measured by the volume of travellers leaving the UK during the holiday period, aviation is government's single greatest recent achievement. The 2003 White Paper said that the UK needed 'a balanced and measured approach to the future of air transport which ... reflects people's desire to travel further and more often by air, and to take advantage of the affordability of air travel and the opportunities this brings'.[16] These benefits should be balanced by ensuring that 'over time, aviation pays the external costs [that] its activities impose on society at large' (note the expression 'over time' – political code for 'when we think we can get away with it').

Nothing in UK government statements yet indicates any real intention to try to diminish the rate of growth in emissions from air travel. There has been support for participation in the carbon trading schemes, but nothing that suggests that politicians want to reduce the number of travellers or increase the price that they pay. The government's abdication of any form of direct responsibility for managing down airline emissions is particularly important because of the central role of the UK in handling international passengers. At any one moment, 20 per cent of international passengers are travelling to or from a UK airport.[17] Aviation is a UK success story and no politician will touch it without clear electoral backing. It is worth mentioning, perhaps, that if aircraft fuel were taxed at the same rate as petrol, the cost of a return flight across the Atlantic would be increased by £200.[18] It will probably be some time before there is widespread public support for such a charge.

What about an air travel emissions trading scheme? The 2012 EU scheme will allow airlines a certain volume of emissions above which they will have to buy more permits. The idea extends the current permit system that covers major industrial users and that has, so far, proved to be virtually no constraint on carbon use. Governments around Europe – and, indeed, the airline industry – are broadly welcoming the prospect of the scheme. Our suspicions should be aroused at this point: if the airlines are in favour, can it be good for the atmosphere? They'll have to pay for growth, but at current prices, the effect will be tiny. At the current permit price of €15 per tonne of emissions, the effect on the cost of flying from London to New York will be about £20. At €20 a tonne, the cost will be less than £30.[19]

Of equal importance to the airlines is the fact that they expect to get most of their initial allowances free, as the electricity generators did. If ticket prices rise, they might

actually be able to increase their profits as a result of the introduction of the scheme. Certainly, there's widespread suspicion that the net effect of the current European permit scheme has been to hand the power generators windfall profits of billions of euros. The European Commission, in charge of designing the aviation scheme, is shameless when describing its likely effect. The first page of any early press release was full of quotations from European commissioners saying that the proposal would reduce emissions. But read on and the story gets a little cloudy. Later in the release the commission boasts that the impact on ticket prices is likely to be 'modest', with prices rising between €0 and €9 per return flight. 'With an increase of this level', it continues, 'aviation demand would simply grow at a slightly slower rate than otherwise.'[20] Emissions trading is going to do very little to protect the global atmosphere from the impact of rapid growth in passenger flights. The European Commission has caved in to the forces that seek to continue profiting from the ballooning growth in air travel.

Of course, this is unsurprising. Democratic societies are locked into competition with other open economies. Good, cheap aviation does not just deliver low-cost holidays in sunny Mediterranean resorts; it oils the wheels of the modern economy. Trying to restrict air travel will undoubtedly affect the ability of the UK economy to maintain relatively fast growth and a high share of investment from foreign countries. 'Britain's continuing success as a place in which to invest and do business depends crucially on the strength of our international transport links' says the UK's 2004 *Transport White Paper*.[21] So, the government must provide more capacity for aviation. Without a revolution in politics that allows the government to abandon its plans to add runways around the UK, the only way that aircraft emissions are going to be checked is by individuals deciding voluntarily that they are not going to fly.

Our governments could, of course, decide systematically to raise the price of fossil fuel energy. One sensible course of action might be to try to quadruple the cost over a period of, say, 15 years using the taxation system. The main problem would be the huge impact on the poorer members of society. The top 10 per cent of households spend less than 3 per cent of their income on gas and electricity. A major increase in prices would have little impact on these people. But the bottom decile has to spend over 10 per cent of its income on these things, and this figure will have risen considerably since the data was last collected. Quadrupled gas prices would mean that a large fraction of the UK population would be obliged to go cold in winter. This is simply not going to happen in a democracy. Governments' freedom to use the price mechanism to decrease the consumption of gas for heating or petrol for cars is extremely constrained.

It is fair to say that governments are continuing to search for painless ways to reduce carbon emissions. But the options open to it are depressingly few. A scheme of 'personal carbon allowances' is sometimes canvassed. Occasionally called carbon rationing, the suggestion is that each member of society is given a total allowance of carbon dioxide each

year. It might currently be 5 tonnes, but would decrease year on year in order to reduce national emissions. The holder would be given a smart card containing the ration, with the balance reducing every time the holder made a purchase of fossil fuel-derived goods. Paying the electricity bill would result in a deduction from the balance, as would a top-up of fuel at the petrol station.

In some ways, this is a hugely attractive scheme. Rich people would have to buy more credits for their air travel from those who choose not to travel. Unlike using taxation, the scheme would not result in the price of home heating increasing for the poor. But carbon allowances are an administrative nightmare, impossibly complex to run, and could be circumvented in an almost infinite number of ways. Instead of driving my car, I could take a taxi. Whose allowance does that trip come from? Does the homeowner trying to keep warm in a draughty Victorian house get a larger ration? Will people off the mains gas network get larger allowances because of the greater carbon cost of heating by electricity? Tradable carbon allowances should continue to get serious investigation; but they are not a panacea within the next 15 years. In support of my scepticism, I need only point to the nearly unblemished record of total failure of most major government information technology projects in the UK over the last 20 years. Carbon rationing is an elegant and completely impractical solution.

Governments also have to wrestle with the implications of our preference for today's consumption over investments to protect our future. Generally, we assume that £1 today is worth more than £1 in a year's time. In fact, human beings often act as if £1 in a year's time has a very low value, indeed. We give the future very little weight in our thinking. This view, carried over to climate change, implies that the benefits of cheap energy today are worth having, even if the future costs are high. We'd rather have the good things now, even if our welfare is adversely affected in ten or twenty years' time. If you agree with this line of argument, it may well not be worth trying to avert climate change. It costs a lot now to reduce greenhouse gases, and we won't value the benefit very highly in the future. As a species, we do tend to eat the entire pudding for supper, rather than making it last several days. Climate change is a sort of borrowing from the future – we get a higher standard of living today in return for lower welfare in the future. Economists generally say that this sort of free choice is to be encouraged. But those who say that future generations can look after themselves (and, after all, they will probably have much greater material prosperity) need to acknowledge that the damage we are inflicting on the global atmosphere may well be irreparable.

Reducing the carbon dioxide emissions of a household can either be done by self-denial – cutting room temperatures, for example – or by installing technologies or devices that consume less energy. Many of these things cost several hundred UK pounds per tonne of carbon dioxide saved, although this book will show that many options are far cheaper than this. They do not seem financially attractive to the average householder, and perhaps they never will. To people borrowing money on a credit card at 25 per cent, the returns

from installing solar panels – at perhaps 7 or 8 per cent a year – must look very unappealing. However, without huge investments in expensive energy-saving or carbon-reducing measures, we are very unlikely even to begin to get a grasp on carbon emissions. Unfortunately governments face very little pressure from voters to mandate these changes.

Aren't companies doing it for us?

In a modern economy, in which economic competition is working actively, no company can choose to make decisions that raise its costs compared to its peers. It would only be a matter of months before its investors called for a change in strategy and began muttering about the need for a new management team. Indeed, most investors would say that companies have a duty to pursue profit, even at the expense of the wider environment, although they might not put it as crudely. Companies therefore tend to act as herd creatures, following trends as long as others are too, but never driving ahead into apparently unprofitable markets. While fossil fuel remains cheap – and it still is compared to the alternatives – we will not see sufficient innovation from large companies unless they see a prospective market from consumers actively seeking low-emissions products.

Companies generally require paybacks on their investments in less than five years, and often much less. Virtually no carbon-reducing technologies provide this sort of return. This is not to say that business is actually opposed to cuts in the level of greenhouse gas emissions. The corporate sector simply wants to ensure that no individual company is required to manage with a small allowance when its competitors are given more. Broadly speaking, as long as emissions reductions are equitably imposed, and right across Europe, business is in favour. Though no company, singly, can do much to reduce emissions, and doesn't want to on its own, business leaders press the government to introduce schemes that universally require reductions in energy use. For example, in early June 2006, a group of the most senior UK corporate heads, including people from companies as diverse as Shell and Vodafone, visited the prime minister to push for tighter, not looser, restrictions.[22] They argued for smaller allowances under the European Emissions Trading Scheme. They spoke in favour of steps to cut emissions from transport, such as congestion charging and road pricing. They even said that building regulations should be tighter in order to improve the energy losses from new buildings. Since 2006 these companies have continued to argue for greater action on climate change.

These proposals will tend to increase business costs. Companies very rarely press for measures that impose penalties on their activities. Why are senior executives asking national and international entities to tighten rules on emissions? I suspect that as individuals they feel uncomfortable leading companies that generate such large absolute amounts of greenhouse gases. As people – ordinary individuals with moral sensibility and a concern for the future of

their race – they know that the arguments in favour of restraint are overwhelming. But as leaders paid to advance their company's wealth and size, they know that unilateral action is impossible. Shell UK is not going to stop drilling for gas just because its managers are nervous about the climate in 50 years' time. So these people want to pass the responsibility on to government, which will force them to be better behaved. We need to be clear: when business asks for lower carbon emissions, it does not intend to actually do anything unless forced by regulation. But as with many forms of regulation, equitably applied, most businesses would find greater restrictions on fossil fuel use perfectly possible to accommodate.

Those business leaders who think about the issue generally see the scale of the climate change problem. The employers' organization, the CBI, is one of the most active proponents of more urgent actions. Many businesses even think that initiatives to decelerate the pace of warming would have a beneficial effect on the European business sector by making it leaner and less energy-intensive. Many companies are now saying that they are using technology to reduce energy in their own operations. But the goods and services that they provide to householders – except a few token projects for public relations purposes – will only be fully re-engineered if consumers demand lower-carbon alternatives.

Other blocks in the road to lower carbon

There's an increasing literature on the non-tangible issues we need to address if carbon emissions are to be held down.[23] Fossil fuel consumption is largely invisible and unobtrusive. Awakening people to the effect of background activity, such as keeping the house warm with an inefficient boiler, is an extremely demanding communications task. This issue is magnified by the extraordinary pervasiveness of fossil fuel energy use. The typical consumer is unable to comprehend the multiple ways in which his or her lifestyle generates greenhouse gases. The ordinary house-owner might unconsciously take a decision to use fossil fuel several hundred times a day – boiling a kettle, flushing the toilet, buying a tin of beans, driving to the station, leaving the computer on at work – and cannot possibly be expected to weigh the carbon consequences of each action.

Many attempts to reduce carbon use are, regrettably, also the subject of potential derision from friends and colleagues. There is strong social pressure to conform to conventional behaviour. A simple decision not to use aeroplanes, the single most important statement a person can make that he or she regards climate change as an important issue, may pose problems for social relationships or prospects at work. Not going on a weekend party to Prague because of a principled refusal to fly is unlikely to endear one to one's friends. A willingness to drop everything and fly to the US is often a precondition of the most successful jobs. Who is going to abandon the hopes of a better paid and higher status job in order to defend a position that much air travel is unnecessary or even wrong?

Most importantly, the majority of people have no sense whatsoever of the scale of the fossil fuel consumption attached to each activity. Here's a comment from author Deborah Moggach, interviewed about a trip to the Galapagos Islands:

> *Like a lot of people, I'm a mass of contradictions. I recycle, compost and have hens that eat my leftovers and garden slugs. But I've got an old house that isn't really draft proofed and I never turn the TV off standby. I jump on planes, but I'm very good about cycling.*[24]

Deborah Moggach shouldn't be criticized for not realizing that an air trip to South America will have contributed 5 tonnes of carbon dioxide or more to the atmosphere, which will be 100 times more important than the impact of her recycling. No one except an expert could possibly hope to know even the approximate impacts of individual acts. The companies that market their goods to us are aware of this, and will try to sell their products as green, even when they fail to meet the most basic standards of energy efficiency.

Realizing that the ultimate responsibility rests on us, not on companies or political leaders, numerous individuals want to act on their own initiative. If the arguments in this book are correct, the only morally responsible position is to act on one's own because no institution or market mechanism has any prospect of effectively reducing fossil fuel use. It is up to individuals; we cannot rely on governments. And because our own personal actions are responsible for a larger and larger share of the total, our responsibility is increasing.

Self-restraint, a much underrated human virtue

It sometimes seems that there is an immutable law of human nature that requires us to reach out for material possessions, even when we don't really need them. Offer people the chance for a higher material standard of living and they will take it. If we can have it, we want it, even at the cost of drought in Africa or flooding in Asia. This feature of human character makes dealing with climate change especially difficult. Democratic governments and profit-driven companies are simply agents that enable us to act out the pursuit of material gain. Battling climate change requires self-restraint, a trait that modern consumer society has almost, but not quite, obliterated.

If this pessimistic conclusion is right, then the battle against global warming was lost long ago. The huge success of modern dynamic capitalism at delivering material prosperity across the world, particularly in the last 15 years, makes the battle against greenhouse gases doubly difficult. First, it has, of course, required huge amounts of fossil fuel to make the goods and services on which we are now increasingly reliant. Second, it makes jumping off the economic escalator more difficult. This second point is a little complex to explain.

I will do so with reference to a particular example. By the late 1970s, the UK was widely regarded as an economic laggard, condemned to a slow relative decline. Over-powerful trade unions, sclerotic management, an ossified class structure, an ingrained anti-capitalist culture and an absurd romantic reverence for its rural past combined to depress the rate of the UK's economic growth.[25]

Margaret Thatcher, prime minister from 1979 to 1990, did more than anybody to change this. Her mission was to rid the UK of its abiding fatalism, its sense that relative decline was inevitable. She succeeded to an extent that now seems remarkable. The most important transformation in the underlying culture may have been a growing respect for material wealth and personal economic attainment. People had previously derived a substantial portion of their status from their job title, their family history or the name of their school, and relatively little from their income or material possessions.

By the end of the Thatcher period, but certainly continuing into the 21st century, economic success – as conventionally defined by income and wealth – had become a more important indicator of social standing. The entrepreneur, City dealer or successful business person is a figure of far greater importance than could have been the case during the 1970s. Of course, in many ways this has been a beneficial transition. Economic growth has enabled major improvements in health, life expectancy and the rate of absolute poverty. Often seen as the most sensitive indicator of physical well-being, the rate of infant mortality in the UK has fallen by over 50 per cent since 1981.[26] Between 1981 and 2002, life expectancy at age 50 increased by four and a half years for men and three years for women and this rise is still continuing.[27] Of course, these important improvements may well have occurred without improvements in material prosperity; but the evidence suggests that at least some part of improved health and, indeed, life expectancy in the UK derives from the country's stronger economic performance.[28]

But the transition to a society that rewards economic success with greatly enhanced status has introduced a new compulsion to become wealthy. There is more of a social cost to resisting fossil fuel addiction. I realize that this is a highly contentious point with powerful arguments on the other side; but the unleashing of entrepreneurial dynamism is, in my opinion, likely to inflate fossil fuel demand, particularly in the form of air travel, larger cars and bigger homes to heat. Stepping off the escalator of material prosperity is difficult in a culture which more openly celebrates wealth and the display of material possessions. Self-restraint in consumption becomes more difficult. I think it is no accident that some Nordic countries, still partly gripped by a Lutheran self-control, are making more progress in carbon reduction than we are.[29] Personal consumption in these countries is, perhaps, less important to self-image.

A fully effective capitalism is, I suspect, a highly competitive, brutal world in which corporations are continuously under threat from new participants in their markets, from innovation and new technologies, and from cut-throat pricing from foreign suppliers. It is these conditions which keep companies on their toes. One very senior regulator once said to me that the whole aim of national competition policy was to rid corporations of their

autonomy. Effective competition, he said, left companies no discretion – everything they did was dictated by customers and the relentless search for better value.

The UK is a more competitive economy than it was, and in most respects this is good. But it does necessarily mean that companies have even less choice about climate change. They are left with little autonomy and they will only pursue carbon reduction if that is what their customers and their shareholders demand. Their customers are unlikely to pay significantly extra for low-carbon goods, so normal profit-maximizing companies will only reduce emissions if it makes strict financial sense. And since the average institutional shareholder owns a company's shares for a matter of months, rather than decades, it is unlikely that the owner will take a view about the price of oil in 2020 and reward a company for taking investment decisions with a view to that very long-term future.[30]

As a result, today's pattern is for companies to make marginal reductions in fossil fuel use, but only where the effort is justified by the immediate cost savings. The volatility and relatively high levels of fossil fuel prices are certainly increasing the incentive to reduce the use of oil-, coal- and gas-derived products; but the effects only barely show up in aggregate national statistics. So, the consequence of the UK's move to a more competitive, innovative and dynamic economy over the past 25 years has been to give a greater significance to consumption that uses extravagant amounts of fossil fuel, combined with a more responsive corporate sector that marches tightly in step to the drum of customer demand.

This book advances the view that voluntary self-restraint may be the most important way for responsible individuals to cut their own carbon use, combined with some personal investments in lower emissions technologies that are not necessarily financially rational.

But we live in a world that gives huge prominence to the rational pursuit of economic self-interest. The triumph of the Western capitalist model is so complete that the idea that our day-to-day consumption of fossil fuel could have a moral or even religious dimension is seen as deeply eccentric. Even those who recognize the importance of climate change rarely allow themselves to contemplate the idea that market- or taxation-based solutions might not be enough. Self-restraint over consumption is a hugely subversive idea in an economic system which has as its core proposition that greater and greater happiness will follow every increase in our personal incomes and spending.

However, deliberate self-denial is the only way in which individuals can help address the global warming threat. Are there any grounds for hope that people will decide to act out moral decisions in their consumption behaviour, even if it means a higher cost or inconvenience? Are there analogous instances that might give us hope that individual consumers can adjust their perceived needs so as to consume less?

The evidence demonstrates that some limited optimism is justified. Recent history shows that consumers do sometimes make purchases requiring them to pay more for goods or services which embody values that appeal to them. The most ethically conscious consumers will do this even when there is no status attached to the product. Twenty years

ago, for example, purchasers of organic vegetables were usually buying them because it seemed right, not because organic foods had a strong positive brand image. In fact, the purchase of organic foods was, to use a loose expression, very 'counter-cultural'. Gradually, however, consumers may move to the next phase. This stage may be the point at which other, less ethically driven, people begin to make the purchase because of some form of cachet or enhanced status derived from using the product. Organic foods have now certainly reached this stage. Eventually, even laggards begin to switch, if only because it is seen as positively evil to continue buying the non-ethical brands. Who now, for example, would knowingly buy cosmetics that were known to be tested on animals?

The move to making low-carbon consumption patterns an endemic feature of the world economy will need to go through these three distinct phases. It does not appear to me to be enough simply to rely on the small number of puritans who dislike consumption of all forms. For widespread personal self-restraint in carbon consumption to become successful, it needs to be developed into a high status activity and, eventually, into the conventional mode of life. The gradual move into being a standard way of living will take generations; but the high costs borne by today's innovators will diminish as low-carbon goods and services decrease in relative price as volumes increase.

It might work as in the following example. Installing ultra-efficient house insulation, for example, is now a goal aimed at by real eco-enthusiasts. It is expensive and does not produce much of a financial return above and beyond normal insulation standards. It is only the socially eccentric who have worried about the 'U' values of walls or other indicators of heat retention. But I suspect that 'eco-housing' of all types is in the process of becoming attractive to the rich and to the famous, even though, in strictly financial terms, it makes little sense. A tightly insulated house might save a few hundred pounds a year in fuel bills, but at a cost of several thousand pounds. Nevertheless, the number of pages devoted to fashionable eco-homes in the pages of the weekend newspapers would indicate growing interest from the elite. Very well-insulated housing will become an object of desirable status, and adoption rates will rise. This will help to push down the cost of extremely good insulation, and, very gradually, ordinary folk will choose to improve their houses for financially rational reasons. It will save enough money to make investment worthwhile. Eventually, not having good insulation will be seen as slightly tacky and somewhat irresponsible.

My optimism is perhaps a little too advanced. But in some areas of food purchasing, ethical brands are making real inroads. One example is the growth of the Fairtrade label. Starting in the Netherlands in 1988 and initially focused only on coffee, the Fairtrade brand mark provides a guarantee that the farmer obtained a relatively high and consistent price for the product. Although still small in terms of its share of the total grocery market, with sales of about £800 million in 2009 out of a grocery market of well over £100 billion in the UK, Fairtrade has had a disproportionate effect. Still growing at over 40 per cent a year in the UK, Fairtrade is an example of how large groups of people are prepared to use

moral criteria in their purchasing decisions. The Fairtrade foundation says that over half UK consumers are 'active ethical consumers'. And who could have guessed even five years ago that conventional brands like Nestle's Kit Kat would decide that moving to Fairtrade sourcing would make good business sense?

Recycling is another activity that generally has no direct reward except a feeling of virtue. Actually, it is even less easy to explain than Fairtrade purchasing. At least with coffee or chocolate there may be a sense that the product itself is better. In the case of recycling, voluntary sorting of glass or plastics is time consuming and sometimes slightly unpleasant. It is certainly easier simply to throw the plastic milk carton in the kitchen bin, rather than washing it, crushing it and then storing it in a recycling box for a couple of weeks. Nevertheless, increasing numbers of people do make the effort to segregate their recyclable wastes and do so out of a sense of moral duty.

Recent survey work[31] also shows that activities such as recycling, in which the individual gains little personally from the action, become much more entrenched if organizations such as local councils make active and sustained efforts to improve recycling rates.[32] The lesson seems to be that if people see evidence that their own selfless actions are being matched by other institutions, then their behaviour becomes more determined and committed. This is another example of the 'I will if you will' phenomenon. Social change can proceed very rapidly if everybody is seen to be under equivalent pressure to behave responsibly. Perhaps 10 per cent of people are deeply resistant to recycling, and their behaviour will take a generation to change. But for almost all others, active recycling shows signs of becoming sufficiently embedded to become a social norm. In other words, those failing to recycle, in some areas of the country at least, are beginning to feel under neighbourhood pressure to conform. There is no reason why, over a period of years, the same social compulsion cannot be imposed when it comes to reducing carbon emissions.

Economists often don't understand actions that do not appear to be driven by the pursuit of what is loosely called 'rational self-interest'. The academic and polemicist John Kay, one of the most robust defenders of the power of the price mechanism, wrote this in response to a leaflet about paper recycling from his council:

> *Recycling is our penance for the material advantages of a consumer society. It is no more sensible to ask about its benefits than to enquire whether Hail Marys do the Blessed Virgin any good. The value of saving paper lies in the virtuous feelings it engenders.*[33]

John Kay's thesis in his article was that throwing waste paper away was bad for the environment and, more widely, that recycling was irrational because of the lack of personal economic return. He poured gentle scorn on those who feel a little better as they tug their paper recycling box into the street on collection day. Economists like Kay don't find it easy

to empathize with those who make an effort for no return. Members of the dismal profession will always tend to bring up the rear in any campaign to get people to take personal responsibility for global warming, claiming that market mechanisms will work better (even economists acknowledge that they are among the least likely to be cooperative and altruistic in their dealings with others).

Moreover, Kay's assertion that paper recycling is counter-productive is almost certainly wrong. A major review of all the available analyses of the 'life-cycle costs' of paper suggests a saving of over 1 tonne of carbon dioxide for every tonne recycled.[34]

As well as recycling and buying Fairtrade products, UK consumers seem willing to pay more for ethically sound purchases across a wide range of goods and services. Probably the single most advanced ethical market is that for free-range eggs. The New Economics Foundation (NEF) reported that 41 per cent of eggs sold in retail shops were free-range in 2004, up from 33 per cent in 2002 and since then the major supermarkets have gradually decreased the space devoted to battery eggs with Sainsbury's finally abandoning them in mid 2009. The steady increase in consumer resistance to factory-farmed eggs meant that it became politically possible for the EU to ban caged chickens by 2012. At the time of writing in early autumn 2009, Tesco's free-range prices were almost 100 per cent above standard eggs, so the ethical decision has some cost to the household. In the case of eggs, the concerned consumer has nearly won – it is now close to being socially unacceptable, at least in some demographic groups, to eat battery eggs. Stores worried about their reputations will not have them on their shelves. The average household only spends £20 a year on eggs, so the financial sacrifice from buying free-range is not huge. Nevertheless, it is a valuable model for other consumer goods.

Across several different markets, a reasonable percentage of people are apparently willing to act as the shock troops of environmental activism. A study for the Greater London Authority, for example, showed that about 19 per cent of the population were willing to pay an extra £5 a month or more for electricity generated from renewable sources.[35] In a completely different field, a smaller but still significant number – 10 per cent – say that they primarily buy second-hand goods for environmental reasons and 17 per cent made purchases locally in order to support nearby shops.[36] Even in financial services, there are people willing to take costly steps in order to do the right thing; the idealistic Triodos Bank has almost 30,000 customers in the UK even though its interest rates on deposits have historically been well below what customers could achieve elsewhere.

So the evidence is that a small but growing number of people are prepared to make a personal sacrifice in order to buy goods or services that are in tune with their own ethical standpoints. The NEF study also showed a concomitant rise in the percentage of people feeling guilty about purchases that they regarded as 'unethical'. The figure doubled, to over one-third of individuals, between 1999 and 2004. There were also increases in people thinking that their behaviour as consumers could affect the way in which companies behaved and this percentage has certainly continued to increase.

Earlier I suggested that the forces of economic competition meant that businesses were not free to act in environmentally responsible ways unless their customers changed their requirements. But when people do start wanting more ethical choices, successful companies are now likely to react more expeditiously, particularly if their reputation for stocking the eco-friendly items might be under threat. The early switch of Marks & Spencer to entirely Fairtrade coffee and the supermarket chain Waitrose's pioneering move to 100 per cent free-range eggs are small but powerful illustrations of how upmarket retailers are now increasingly anxious to keep their image consistent with the aspirations of their customers. Marks & Spencer's pioneering Plan A, a scheme for making radical reductions to emissions and waste as well as increasing the amount of ethically sourced products, is another example of a nimble retailer understanding that consumer tastes are moving rapidly. The direction of travel is only one way – low-carbon goods and services are going to become more popular and your actions as a consumer can increase the speed of the transition.

In many different markets – whether it is renewable energy or local food – it looks as though about 5 per cent of people are serious activists, resolutely prepared to pay more and endure possible inconvenience to do what they think is right (my mention of inconvenience will be all too familiar to anybody who has had to wash carrots from a local organic box scheme or farmers' market). This 5 per cent is not composed of what marketing people usually call 'early adopters' – normal mainstream people who are quick on the uptake. Today's climate change activists are the very small group who act from moral imperatives, not because they want to get on a bandwagon early.

Getting up from this low level of acceptance to the 40 per cent share of sales at which people appear to start feeling bad about not buying the ethical choice seems to require two steps. First, the items must become fashionable: newspaper columnists must write glowingly of the celebrities who use the product and they must suggest psychic benefits that can only be obtained through extensive use. Fairtrade is clearly at this point in its development. It has an aura of goodness about it even though, to be frank, until recently much Fairtrade coffee has been of indifferent quality. The second, and more important, stage is when prosperous 'early adopters' become committed users and recommend it to their friends. At this point in the marketing of any new product, the promoters can be very confident that the item stands a good chance of eventual success.

I can see several important categories of carbon saving that look as though they might cross the yawning chasm between the nutty activists and the fashionable people who populate our major urban centres. Our solar panels generate regular enquiries from local people wanting to install their own. In an act that might be seen as local one-upmanship, several neighbours have now put up photovoltaic panels with twice the power of ours. This is absolutely wonderful: solar panels might soon become a way of enhancing your local status.

Locally farmed seasonal organic food is another possible target – not only is it good for carbon emissions, it can be sold as healthier and tastier. Better central heating controls,

which might save 5 per cent of the emissions from house heating, could also be candidates for entry into the shopping baskets of the rich and famous. They can be attractive electronic devices sitting visibly on the walls which the (male) owners can boast about to their friends. But in my pessimistic moments, it sometimes seems a struggle to see how we can persuade people not to fly as regularly. The idea of avoiding winter holidays in the sun, which are such an effective badge of membership of the high-earning professional classes, is not going to be easy to sell. However, we can certainly hope that the rich will buy carbon offsets to make good part of the damage from air travel. The medieval elite were prepared to buy indulgences from the Pope's agents for their peccadilloes, and carbon offsets can fill a similar niche. In the first edition of this book I wrote that 'it may not be easy to promote the value of smaller cars'. I was too pessimistic. Not only have high fuel prices and company car taxation increased the cost of large vehicles but there has been a definite switch to seeing smaller cars as more attractive than heavy and inefficient larger vehicles. Advertisers focus heavily on the green credentials of nippy little city cars. The swing towards hybrid and even electric cars has undoubtedly begun to gather pace as cars slowly cease to be strong statements of status.

Persuasive research into people's responses to environmental messages shows the importance of establishing strong social norms that reinforce appropriate behaviour.[37] A series of experiments in the US looked at the influence of various different written messages in influencing whether guests reused their towels in hotels or sent them to be washed every day. Washing fewer towels saves hotels money, but also reduces the use of fuels necessary to heat water for washing. The researchers left some messages in hotel rooms that stressed generic goals, such as 'Partner with us to help save the environment'. These texts were less influential in getting hotel guests to recycle their towels than messages that stated an expectation that the user would behave according to a social norm. The most influential message was: 'Join your fellow citizens in helping to save the environment', which got over 40 per cent of guests to reuse towels, compared to a base of 20 per cent when the card said: 'Help the hotel save energy'.

According to the academic researchers looking at the results, the message that worked best was successful because it suggested that the social norm was for the guest to request a reuse of the towels. The lesson drawn for those circumstances when the citizen is asked to be 'good' is to emphasize how many other people are already behaving that way. According to this theory, a statement that 'the vast majority of people don't drop litter' would be more effective at depressing the level of littering than a comment that emphasized that many people do, such as: 'Don't join the litter louts'.

In the case of energy use, it would be more effective to use a slogan that said 'Responsible people are reducing their thermostat settings in winter' rather than 'High temperatures waste energy' or 'Too many people have their house too warm'. This last statement would be particularly counter-productive because it emphasizes that the social norm may well be a

wasteful use of energy. It says that other people have excessively hot houses, and therefore may make it seem attractive to run the thermostat high to fit in with the neighbours. Stressing the benefits in terms of social approval of taking the 'good' action, rather than noting the deleterious effects of 'bad' actions, is now a widely understood principle – though surprisingly often ignored in the advertising of consumer goods. Research findings separately show that instructions that tell people what not to do are more effective than those that simply describe the effects of actually doing environmentally destructive acts. For example, a statement that said 'Don't take aeroplane flights because they are one of the most important causes of global warming' would be better than saying 'Those who take aeroplane flights are helping to increase global warming'. Researchers seem to be saying that people absorb a strong injunction not to do something more effectively than they do with simple statements of fact – for example, 'Stop smoking' is better than 'Smoking kills'.

The lesson for those interested in changing human behaviour is that communications messages aimed at fostering better behaviour in response to global warming need to stress how many other people are behaving, as well as to frame the slogan with a strong statement of what not to do. We need to use the dark arts of the advertising agency to help us make carbon saving more fashionable.

Energy saving begets energy saving

Those who have tried to make real cuts in their own carbon emissions all know a little secret. Unlike, say, dieting or giving up tobacco, conserving energy is so easy that it almost becomes addictive. A small effort can cut household electricity bills by 10 per cent and, once achieved, a little twitch on the heating thermostat can save another 10 per cent or so off the gas bill.

Why is this? If reducing energy use is so easy, why didn't we all start earlier? The reason probably lies in the insidious and unconscious growth in our personal energy demand. Energy is both cheap and largely invisible. If I leave the computer on overnight, it doesn't cost me a measurable amount of money and, in fact, it would be very difficult to see from the meter just how much energy I had used. But once I take a decision not to allow appliances to stay on unnecessarily, it is rather simple to turn everything off, and within three months the bills will be lower. If I become habituated to not wasting energy and make it a normal daily activity, it becomes easy.

The painlessness of energy saving is most noticed by people who install their own renewable energy systems, such as solar hot water. The mere act of installing the equipment seems to produce a hugely increased sensitivity to energy use. I noticed this when we put a hot water and photovoltaic system on our roof. The apparent 'savings' from the solar hot water system were about three times what could have been expected. We noticed an implausibly high figure for the reduction in electricity consumption as well. We're still

quite large consumers; but we cut our bills by far more than could have been explained by the relatively small quantity of the sun's energy falling on our roof. This was not unusual; the phenomenon has been seen across the world. Before, our usage had been gently drifting upwards – like most British households; but immediately after the panels went up, the meters stopped spinning so fast and haven't increased since. I suppose the most important change for us was a decision not to run the house at 20°C in winter. We moved the thermostat down to 18°, and did notice the difference, but only for a matter of days. Within a few weeks, 18° seemed as warm as 20° had before. The gradual ratcheting upwards must have been a sort of mild addiction; we had needed a 'fix' of rising temperatures to keep feeling warm. But as with, say, strong coffee, one can take a decision to reduce one's consumption and the pain is only mild and temporary.

The upbeat tone of the last few pages has had a purpose. Many people feel a gloomy despair about climate change. Individuals can do so little directly to affect the future health of the global atmosphere. What I have tried to suggest is that there are reasons for optimism. All great social movements were started by determined and slightly eccentric individuals who refused to accept the prevailing social norms. Active carbon avoidance is a principle that is worth pursuing and does have effects on friends and neighbours. It can become a communal activity. The future of the human race is dependent upon sufficient numbers of individuals eventually being persuaded to join the movement.