



A Green New Deal

Joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices

The first report of the Green New Deal Group

This report is the first publication of the Green New Deal Group.



Meeting since early 2007, its membership is drawn to reflect a wide range of expertise relating to the current financial, energy and environmental crises. The views and recommendations of the report are those of the group writing in their individual capacities. The report is published on behalf of the Green New Deal Group by **nef** (the new economics foundation).

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The global economy is facing a ‘triple crunch’. It is a combination of a credit-fuelled financial crisis, accelerating climate change and soaring energy prices underpinned by an encroaching peak in oil production. These three overlapping events threaten to develop into a perfect storm, the like of which has not been seen since the Great Depression. To help prevent this from happening we are proposing a Green New Deal.

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Executive summary

The global economy is facing a 'triple crunch'. It is a combination of a credit-fuelled financial crisis, accelerating climate change and soaring energy prices underpinned by an encroaching peak in oil production. These three overlapping events threaten to develop into a perfect storm, the like of which has not been seen since the Great Depression. To help prevent this from happening we are proposing a Green New Deal.

This entails re-regulating finance and taxation plus a huge transformational programme aimed at substantially reducing the use of fossil fuels and in the process tackling the unemployment and decline in demand caused by the credit crunch. It involves policies and novel funding mechanisms that will reduce emissions contributing to climate change and allow us to cope better with the coming energy shortages caused by peak oil.

The triple crunch of financial meltdown, climate change and 'peak oil' has its origins firmly rooted in the current model of globalisation. Financial deregulation has facilitated the creation of almost limitless credit. With this credit boom have come irresponsible and often fraudulent patterns of lending, creating inflated bubbles in assets such as property, and powering environmentally unsustainable consumption.

This approach hit the buffers of insolvency and unrepayable debts on what we think of as 'debtonation day', 9 August 2007, when the banks suddenly fully understood the scale of debts on the balance sheets of other banks, and stopped lending to each other.

In the same year, natural disasters struck body blows to entire national economies, and rising prices began to alert the world to the potential scarcity of oil. At both ends of the climatic spectrum, Australia saw a prolonged drought decimate its domestic grain production, and Mexico saw floods wipe out the agricultural production of an entire large state. In the oil markets, growing numbers of whistleblowers pointed to the probability of an early peak in production, and a possible subsequent collapse of production. The International Energy Agency (IEA) said an oil crunch is likely in 2012.

Drawing our inspiration from Franklin D. Roosevelt's courageous programme launched in the wake of the Great Crash of 1929, we believe that a positive course of action can pull the world back from economic and environmental meltdown. The Green New Deal that we are proposing consists of two main strands. First, it outlines a structural transformation of the regulation of national and international financial systems, and major changes to taxation systems. And, second, it calls for a sustained programme to invest in and deploy energy conservation and renewable energies, coupled with effective demand management.

In this way we believe we can begin to stabilise the current triple-crunch crisis. We can also lay the foundations for the emergence of a set of resilient low-carbon economies, rich in jobs and based on independent sources of energy supply. This will create a more stable economic environment in which there is a lot more local production and distribution, and enhanced national security.

In the first half of this report we examine the financial, economic and environmental landscapes that are the backdrop to this triple crisis. In the second half, we propose a series of policies that can be used to tackle the problems we have identified.

The Green New Deal

We call our programme a Green New Deal – one that combines stabilisation in the short term with longer-term restructuring of the financial, taxation and energy systems. The Green New Deal is international in outlook, but requires action at local, national, regional and global levels.

Focusing first on the specific needs of the UK, an interlocking programme of action needs to involve:

- **Executing a bold new vision for a low-carbon energy system that will include making ‘every building a power station’.** Involving tens of millions of properties, their energy efficiency will be maximised, as will the use of renewables to generate electricity. This will require a £50 billion-plus per year crash programme to be implemented as widely and rapidly as possible. We are calling for a programme of investment and a call to action as urgent and far-reaching as the US New Deal in the 1930s and the mobilisation for war in 1939.
- **Creating and training a ‘carbon army’ of workers to provide the human resources for a vast environmental reconstruction programme.** We want to see hundreds of thousands of these new high- and lower-skilled jobs created in the UK. It will be part of a wider shift from an economy narrowly focused on financial services and shopping to one that is an engine of environmental transformation. The UK has so far largely missed out on the boom in ‘green collar’ jobs, with Germany already employing 250,000 in renewable energy alone.
- **Ensuring more realistic fossil fuel prices that include the cost to the environment, and are high enough to tackle climate change effectively by creating the economic incentive to drive efficiency and bring alternative fuels to market.** This will provide funding for the Green New Deal and safety nets to those vulnerable to higher prices via rapidly rising carbon taxes and revenue from carbon trading. We advocate establishing an Oil Legacy Fund, paid for by a windfall tax on the profits of oil and gas companies. The monies raised would help deal with the effects of climate change and smooth the transition to a low-carbon economy.
- **Developing a wide-ranging package of other financial innovations and incentives to assemble the tens of billions of pounds that need to be spent.** The focus should be on smart investments that not only finance the development of new, efficient energy infrastructure but also help reduce demand for energy, particularly among low-income groups, for example by improving home insulation. The science and technology needed to power an energy-and-transport revolution are already in place. But at present the funds to propel the latest advances into full-scale development are not.

- **Re-regulating the domestic financial system to ensure that the creation of money at low rates of interest is consistent with democratic aims, financial stability, social justice and environmental sustainability.** Our initial proposals for financial renewal are inspired by those implemented in the 1930s. They involve the reduction of the Bank of England's interest rate to help those borrowing to build a new energy and transport infrastructure, with changes in debt-management policy to enable reductions in interest rates across all government borrowing instruments. In parallel, to prevent inflation, we want to see much tighter controls on lending and on the generation of credit.
- **Breaking up the discredited financial institutions that have needed so much public money to prop them up in the latest credit crunch.** We are calling for the forced demerger of large banking and finance groups. Retail banking should be split from both corporate finance (merchant banking) and from securities dealing. The demerged units should then be split into smaller banks. Mega banks make mega mistakes that affect us all. Instead of institutions that are 'too big to fail', we need institutions that are small enough to fail without creating problems for depositors and the wider public.
- **Re-regulating and restricting the international finance sector to transform national economies and the global economy. Finance will have to be returned to its role as servant, not master, of the global economy, to dealing prudently with people's savings and providing regular capital for productive and sustainable investment.** Regulation of finance, and the restoration of policy autonomy to democratic government, implies the re-introduction of capital controls. These are vital if central banks and governments are to fix and determine one of the most important levers of the economy – interest rates
- **Subjecting all derivative products and other exotic instruments to official inspection.** Only those approved should be permitted to be traded. Anyone trying to circumvent the rules by going offshore or on to the internet should face the simple and effective sanction of 'negative enforcement' – their contracts would be made unenforceable in law. Ultimately our aim is an orderly downsizing of the financial sector in relation to the rest of the economy.
- **Minimising corporate tax evasion by clamping down on tax havens and corporate financial reporting.** Tax should be deducted at source (i.e. from the country from which payment is made) for all income paid to financial institutions in tax havens. International accounting rules should be changed to eliminate transfer mispricing by requiring corporations to report on a country-by-country basis. These measures will provide much-needed sources of public finance at a time when economic contraction is reducing conventional tax receipts.

We also urge the UK to take action at the international level to help build the orderly, well-regulated and supportive policy and financial environment that is required to restore economic stability and nurture environmental sustainability. Our Government's objectives should include:

- Allowing all nations far greater autonomy over domestic monetary policy (interest rates and money supply) and fiscal policy (government spending and taxation).
- Setting a formal international target for atmospheric greenhouse gas concentrations that keeps future temperature rises as far below 2°C as possible.
- Delivering a fair and equitable international climate agreement to succeed the Kyoto Protocol in 2012.
- Giving poorer countries the opportunity to escape poverty without fuelling global warming by helping to finance massive investment in climate-change adaptation and renewable energy.

- Supporting the free and unconstrained transfer of new energy technologies to developing countries.

In the words of France's President Sarkozy, 'we have to put a stop to this financial system which is out of its mind and which has lost sight of its purpose.' The Green New Deal will rekindle this vital sense of purpose, restoring public trust and refocusing the use of capital on public priorities and sustainability. In this way it can also help deliver a wide range of social benefits that can greatly improve quality of life in the future.

There is also an immediate imperative to restore some faith that society can survive the dreadful threats it now faces as a result of the triple crunch. Beyond that, we believe the Green New Deal can deliver a crucial national plan for a low-energy future and its provision on the ground. The absence of any such plan at present leaves the country very vulnerable. There is no risk analysis of the peak-oil threat, and there is no contingency plan for what would happen if oil and/or gas supplies collapsed rapidly. Our plan would include oversight and coordination for generating the funding from government, the energy industry and a range of private savings vehicles for investment in a vital multi-decade programme for the transition to a low-energy future. In short, it is a route map for the journey from energy and economic insecurity to one of energy and environmental security.

Foreword

This report is a call to wake up to the scale of the menace posed to the natural world, the global economy and all our livelihoods by a triple crunch: the present global financial crisis, climate change and the rapid depletion of oil.

To develop innovative, sound solutions that will deal with the gravity of this triple crunch we have convened a group of 'new economists' whose backgrounds range from the City, to the oil industry and the labour and environmental movements. We set out to envision a different future, and propose policies for renewal. This report is the result. It is a call for a radical transformation in the financial and economic model that has fuelled these crises. In it we propose a Green New Deal.

As our executive summary suggests, the Green New Deal is designed to address these great threats confronting society and restore stability to our financial, political and ecosystems.

In doing so, we hope to correct a number of critical oversights. These include the ways in which environmentalists have tended to neglect the role of the finance sector and economic policy; how those involved in industry, broadly defined, have failed to grasp the malign effects of the finance sector on the overall economy; and how trade unionists have for too long ignored financial and environmental concerns.

We hope that the publication of this report will help bring these diverse social and industrial forces together, leading to a new progressive movement. We believe that our joint signatories point to an exciting possibility of a new political alliance: an alliance between the labour movement and the green movement, between those engaged in manufacturing and the public sector, between civil society and academia, industry, agriculture and those working productively in the service industries.

Such a political alliance is vital if we are to challenge the dominance of the finance sector in the economy, its threat to the productive sectors of the economy, its corruption of the political system, and its corrosion of social and environmental values.

By proposing a Green New Deal, this report acknowledges the limits to our ecosystem; that 'the biosphere that supports us is finite, non-growing, closed and constrained by the laws of thermodynamics', as the environmental economist Herman Daly put it.

The Green New Deal promotes 'joined-up thinking' about the four systems that dominate our world: the market, the state, civil society and the ecosystem. We hope that it will lay the basis for a radical transformation and renewal of our financial, political and ecosystems.

The Green New Deal Group, July 2008

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Part 1: The triple crunch

The financial crunch

'The money changers have fled from their high seats in the temple of our civilization. We may now restore that temple to the ancient truths. The measure of the restoration lies in the extent to which we apply social values more noble than mere monetary profit.'

President F.D. Roosevelt, inaugural speech, 1933

Introduction

President Roosevelt was bitter and furious with the financial sector in the early 1930s, as the Great Depression unfolded after the stock market crash of October 1929. As a result of excesses in the financial sector, the world was coming to terms with large-scale, systemic and long-term economic failure. Nearly 80 years later, it has become clear that we risk returning to those days. A massive bubble of debt inflation has burst, and with it the asset bubbles that debt generated: in property, stocks and shares, brands, and commodities like oil, grains and gold.^{1,2,3} Very hard times lie ahead.

This economic failure has been exacerbated by a finance sector deregulated by politicians and central bankers. The finance sector has behaved in ways that are unethical, irresponsible, greedy and – at times – fraudulent. Financiers have borrowed and lent almost without limit, gambled recklessly and profited massively. In order to take their places in the casinos that have evolved, many in the finance sector have deceived fellow bankers about the creditworthiness of their borrowers, about the value of assets on their books, and about the extent of their liabilities. They have used false accounting to borrow more on international capital markets, paid large fees to rating agencies for inaccurate ratings on some very questionable assets, and then used these ratings to entice investors, such as pension funds, into buying them.

Commentators, reluctant to embrace the full implications of the crisis, tend to call this misleading activity 'mispricing risk'. In our view it is simply unethical behaviour. Bankers, investors (including pension funds) and regulators have been deceived as to the true liabilities of financial institutions.

On 9 August 2007 a more accurate assessment of liabilities finally focused minds, and the financial system froze with fear at the scale of the debts, and the probability of deception. The fear and distrust were so great that banks refused to lend to each other. We think of that day as 'debtonation day'.^{4,5} We believe it will come to be seen as the beginning of the end of the deregulation and privatisation of finance that have characterised economics from the last quarter of the twentieth century. Before we go on to explore the implications of that argument, let us first explore further the anatomy of the current financial crisis.

Credit creation and its potential consequences

The peculiarity of money and its creation is scarcely discussed publicly, but it is of the greatest importance. Properly understood – and controlled – it can be a force for

great good, for prosperity and social justice. Misunderstood and freed from control, it is a dangerous and powerful agent of instability and injustice.

Creating money requires no more than the posting of an entry into a ledger. If not regulated this credit becomes 'easy money'. If interest rates are not kept low by regulatory means, charging 'rent' on that easy money or credit can quickly compound the outstanding debt, and render it unpayable. A combination of easy money and high real rates of interest, particularly over the 1980s and 1990s, made the current debt crisis highly predictable.

In recognition of how easy and impactful it is to create credit, and how high rates of interest can quickly lead to usury and bankruptcy, credit creation and the setting of interest rates have historically been strictly regulated and transparently governed by accountable central banks and governments. Since the 1970s, however, we have lived through an era of liberalisation in which politicians and governments permitted, and indeed came to celebrate, a 'light touch' in the regulation of credit creation. This period has seen toleration of a lack of transparency in the financial system, with governments looking away while interest rates were set by creditors (banks in this case) at rates that ultimately proved unpayable.

Credit fuels property and other asset bubbles

The availability of 'easy credit' inflated the value of assets in the Anglo-American economies through the 1980s and 1990s and the first years of the twenty-first century.

Banks were able to issue credit almost without limit and with little official oversight. A perceived constraint is that credit must be guaranteed against the *current* value of an asset, for example a property. As property prices rose to dizzy heights in the UK, so the amount of available credit set against property rose too.⁶ Homeowners could withdraw equity from this increased value, and spend it. This gradual blowing up of the credit bubble served to further inflate house and other prices, leading to massive price bubbles for assets such as stocks and shares, vintage cars, works of art, race horses and so on.

This system worked as long as the credit/debt created by banks or mortgage companies equalled or remained lower than the value of the guaranteed asset, and the asset could be 'foreclosed upon' as repayment of the debt. But asset (e.g. property) prices can fall, and when they do the value of the debt remains the same. As we go to press, 8.8 million US households (representing about 22 million people) own properties that are worth less than the debt outstanding. House prices are still falling, and rates of interest set by private banks – the London Inter-Bank Offered Rate (LIBOR) – are rising.⁷ Furthermore, unemployment is rising, jeopardising the repayment of debts.

Defaults on sub-prime mortgages, on which so much attention has been focused, are just one of the consequences of this system of 'easy but dear money'. Sub-prime was the first 'shoe to fall'.

As this report went to press, many were predicting that a second 'shoe' was about to fall. Corporate debt is an even greater and as yet unrealised threat, exemplified by a mass of opaque financial instruments. Huge as household debts involved in this disaster are, they are relatively small compared to outstanding corporate liabilities. About \$50–60 trillion of liabilities are held as a form of insurance in case loans made by banks to companies, or bonds issued by companies, go wrong. These forms of protection are known as credit default swaps (CDSs). They are not swaps at all, but protection that banks hold with *unregulated* insurance companies. These insurers have naturally demanded high premiums for taking on the risk that companies might default on their bonds or loans. They have charged high fees but they are not bound, like traditional insurance companies, to hold the collateral needed to compensate banks, should companies default.⁸

In the event of a large number of companies defaulting, many insurance companies are likely to go bust, and banks are likely to be denied the protection they have purchased at high cost. This could push them into insolvency.

We, and many others, fear that the financial crisis will lead to a massive wave of corporate defaults as a large 'fat tail' of companies jettison their debts. These are businesses that have very low profitability, face rising energy costs and have high levels of 'junk' debt. As credit crunches, or lending tightens, their debts will be repriced at higher rates of interest. Because their profitability is too low to repay costly debts, these companies will likely default, tipping their lenders – banks and institutions such as hedge funds – into crisis.⁹

This unwinding of corporate debts, together with subsequent write-downs and losses by banks, means that there is worse to come. We expect that the sub-prime debt crisis will soon come to be seen as just the first domino to fall in a line of adjacent dominos, threatening a systemic crisis.

Until recently, little was known about these systemic risks to the global economy. The finance sector's opaque, complex financial instruments were well hidden from public scrutiny. No more. The debtonation of 9 August 2007 froze not just lending but also trust between banks. It led to the subsequent failures of Northern Rock and Bear Stearns and a range of hedge funds. It also contributed to the widely predicted insolvency of the USA's biggest mortgage company, Countrywide Financial, and to the problems facing Britain's Bradford and Bingley and the Royal Bank of Scotland.

The debtonation occurred because banks and their regulators finally woke up to the scale of ultimately unpayable debts often hidden on balance sheets. These debts and a tsunami of litigation continue to threaten banks, mortgage lenders and other financial institutions with bankruptcy.

The growth of inequity

While we may all have access to money – in the form of wages, pensions and so on – not all of us have access to credit. Only those with existing assets such as property, often the rich, can borrow against those assets. Those without assets have to take on huge risks, pay loan sharks exorbitant rates of interest for unsecured credit, or go without. Furthermore they rely on their wages, salaries or the prices of their goods to improve their living standards. The rich rely on rent from their assets.

For those who do have access to credit, the ease with which it can be created has inflated the value of the assets they own. Too much money chasing too few goods and services leads to inflation. In the same way, too much credit chasing too few assets inflates the value of assets. This explains largely why UK house prices have risen by 150 per cent since 1996. Easy money or easy credit has been poured into assets owned by those who are better off.

This inflation of assets explains why the rich have got richer within the liberalised financial system, and the poor have become poorer and more indebted. It is a system in which farmers, retailers and small businesses struggle to make profits from falling prices for goods, while the pay of middle-income earners and the poor shrink as a share of the economy. In the mean time, the prices of assets such as housing have, until recently, remained high, and so the poor and middle-income earners are obliged to borrow in order to put or repair a roof over their heads.

Central bankers and finance ministers are, almost without exception, overly concerned to prevent the inflation of prices and wages. They have consequently developed policies for holding prices and wages down. By contrast, they have turned a blind eye to the inflation of assets.

Passing bankers' bills to taxpayers

The credit crunch panicked politicians and central bank governors. They feared that without the ability or credibility to borrow, many institutions could fail and the whole economy could be destabilised. As a result, central bankers rushed to provide 'liquidity' to eligible banks. The USA's Federal Reserve has swapped \$500 billion of the \$700 billion safe Treasury bills on its balance sheet for potentially unsafe assets, such as sub-prime mortgages. As we know that many of these sub-prime mortgages are in default or likely to be in default ('toxic' to use the term used by financiers), the Federal Reserve is taking very big risks with its taxpayer-backed Treasury bills.

In the UK, the Bank of England has made direct loans and guarantees totalling about £55 billion to the failed Northern Rock bank and its lenders. Once the Government nationalised the bank, the State's liabilities rose to £110 billion, because taxpayers were now guaranteeing the entire balance sheet of Northern Rock.¹⁰ The financial risk to each and every UK tax payer had risen to £3,500. As this report goes to press there are signs of a threat to Northern Rock's ability to repay the Government.¹¹

At the same time, the Bank of England is preparing a convoluted 'pawnshop' deal, to bail out banks such as the Royal Bank of Scotland (RBS) to the tune of approximately £50 billion. RBS had paid what many considered to be over the odds in the falling market of 2007 for an investment bank, ABN Amro. Instead of the free market disciplining the RBS Chief Executive for this unwise risk, the Government and the Bank of England chose to reward him by offering his bank a £50 billion bail-out. Rewarding failure, as free marketers frequently argue, leads to moral hazard – the risk that the bank will continue to repeat mistakes, confident that the taxpayer will always bail it out.

How was this funding for Northern Rock and RBS raised? Was it added to the Labour Government's expenditure estimates? Did the Public Sector Borrowing rise? Did taxes have to go up? Will taxes go up? The answers to these questions are shrouded in mystery. Instead what these events have revealed is that the Bank of England can of course create money – or credit – without resorting to taxpayers. The Governor has used this power to raise the finance needed to help cover private losses and effectively *reward* the private banking sector for grave errors in risk-taking.

Only a few weeks after the rescue of RBS and its Chief Executive, the UK Health Secretary called for 'radical change' in social care. Alan Johnson launched a consultation into the future of care services amid claims that the system in England is heading towards a £6 billion funding gap within 20 years. He argued that *public* funding was a vital part of the debate, but it was 'also a question of individual choice, enabling people to live as independently as possible for as long as possible'. In other words, the Government could not afford £6 billion over 20 years, and would expect the elderly to raise part of the sums needed for their care.

In the same week the Bank of England was mobilising public funding of £50 billion to rescue RBS and its highly paid, risk-taking Chief Executive. If £50 billion can be raised in a week to save a bank that has been hugely profitable for its investors, why can the Bank of England not use the same measures to raise £6 billion over the next 20 years, to finance decent care for the elderly? The Bank of England would retort that RBS is expected to repay its loans, which cannot be said for funding provided to the elderly. But we know that there is a strong chance that Northern Rock, and indeed RBS, could default, which means that the Bank of England's largesse is effectively a bail out.

We have learned from this experience that the Bank of England can easily generate the resources needed to solve a crisis. It has chosen to do so, quietly and without public fanfare, to bail out a private bank. It does not choose to do so to finance care for the elderly.

It is our view that rescuing private banks and other financial institutions in this way is a fundamentally hypocritical characteristic of globalisation. Central bankers opposed to public spending for infrastructure or welfare purposes appear more than willing to make public funds available to private, wealthy risk-takers. The International Monetary Fund (IMF), which does not make a habit of consulting taxpayers, urged governments in March 2008 to 'intervene with taxpayers' money to shore up the financial system and prevent a downward credit spiral from taking hold'.^{12,13} In other words, the IMF and key central bankers watched for decades as the finance sector privatised historically unprecedented financial gains. They then stepped in to nationalise their financial losses.

Because the bail outs are seldom transparent and are shrouded in complexity and mystery, journalists do not delve too deeply and the public remains largely ignorant. The ultimate cost to taxpayers, who back up the Bank of England and the Federal Reserve, is not declared and is not widely known.

The loss of control by central bankers

Providing RBS and other banks with 'cashable' assets pumped 'liquidity' into the system, but did not address the central problem – the *insolvency* of financial institutions with unfunded, uncollateralised debts. Taking on more loans and debts from the Bank of England probably worsened their condition.

Despite the ideological U-turns and the extraordinary largesse we have witnessed, it is now clear that neither central bank 'liquidity' nor lower official interest rates could have dealt with the levels of insolvency and the structural imbalances in the system that have developed. The truth is that banks, such as Northern Rock, hedge funds and broker dealers, such as Bear Stearns, were not just temporarily short of cash; they were effectively insolvent. Pumping more liquidity into these failed financial institutions did not ease the risk of systemic financial meltdown. It was too late for that.

The cause of the meltdown was the ongoing process of 'deleveraging' whereby banks and other institutions were engaged in a massive write-down of their artificially and often fraudulently inflated financial assets. There were fire sales of these assets, which were 'marked to market' by accountants fearful of suffering the punishment meted out to Enron's colluding accountants and determined to establish real value.

Deleveraging brought assets closer to their true value. But deleveraging also led to the failure of institutions in the 'shadow financial system' – which in turn threatened systemic failure. A vicious circle of writing down assets to much lower values – accompanied by further losses, credit contraction, forced liquidation and fire sales of assets at below fundamental prices – will lead to what Professor of Economics at New York University, Nouriel Roubini describes as 'a cascading and mounting cycle of losses and further credit contraction'; in other words, a systemic crisis.¹⁴

The question was not whether systemic failure would occur, but how severe the failure would be.

Interest rates continue to rise

Meanwhile privately fixed interest rates, set by the British Bankers Association and known as LIBOR, have continued to rise – in defiance of the official rates set by central banks. This is the clearest evidence of central banks and governments losing control over a key lever of the economy: the power to set the rate of interest. The rise in LIBOR reflects the cost to British banks of raising funds in a market in which trust and credibility evaporated on debtonation day. As LIBOR is regarded as the primary benchmark for short-term interest rates globally, the growing gulf between LIBOR and official rates fixed by central bankers serves to emphasise the impotence of central bank governors in the midst of financial meltdown. They seem powerless now, just as they appeared powerless to prevent the excesses in the first place.

Excessive credit: mortgaging the Earth

As the credit bubble grew and grew, there was another deleterious impact: it essentially mortgaged the Earth. Easy credit enabled consumers and producers to live beyond their means, and beyond the means of the global environment. In the USA this was represented by a rise in large, gas-guzzling sports utility vehicles and the building of ever bigger houses.

The massive increase in consumption was a byproduct of economies that had prioritised one sector of the economy – consumption – and downgraded government spending and long-term investment as a share of GDP. Anglo-American finance ministers have encouraged the growth of 'one-legged' economies based almost entirely on consumption or shopping. Consumption in 2007, for example, made up 70 per cent of US GDP.

This credit-fuelled consumption means that the world's richest economies have built up massive ecological deficits. While mainstream economists railed against government budget deficits, they ignored the limits of ecosystems, and the way in which economies were living beyond the constraints of 'ecological budgets'. Increased consumption by rich nations has intensified exploitation of the Earth's assets and pollution of its atmosphere and carbon sinks – the forests, soils and seas that have the capacity to absorb emissions.

Society was mortgaging the Earth, and the future.

How did we get here when we have been here before?

As the financial market crisis began, the head of the IMF was quick to defend the status quo. The world needed to learn lessons, Roderigo de Rato said, 'without renouncing financial liberalisation and financial globalisation – because that is at the heart of the success of the world economy'.

We disagree. The notion that finance should be free to set its own rules has been the mantra of those in positions such as Mr de Rato's for nearly 40 years. Yet virtually no debate has been permitted on the merits of the system. The modest debate that has been held has excluded the public and most politicians.

Independence for the Bank of England was not debated or even mentioned in Labour's manifesto before the party came to power in 1997. Just as lamentably, the economics profession has tended to justify the actions of financial power with a free market theory that has ignored the adverse impact of this financial model. But as the financial crisis has unfolded this economic consensus has been shaken to its core.

The tragedy is that our predicament is the result of ignoring, denying and even concealing lessons known to our predecessors. The most important of these lessons is that the interests of the private financial sector are opposed to the interests of society as a whole. Our predecessors insisted that democracy be placed in a position superior to the power of money, that finance should be servant and not master to the economy and society. The economic cataclysm of the Great Depression came to be regarded as the direct consequence of liberal financial arrangements that prevailed in the 1920s (under the 'gold standard').

Between 1931 and 1970 finance was wrested from the private sector and placed in the hands of the state. From 1931 all aspects of interest rate, exchange, banking, and financial market policy became a matter for government. Central banks were brought under increased public control, or even nationalised, as in Britain and France. Driving the implementation of these policies was a succession of left-leaning politicians – Franklin Delano Roosevelt, Leon Blum and, later, Clement Attlee. But the instigator and genius behind this radical re-ordering of society was the British economist, John Maynard Keynes.

Keynes and the precedents in the 1930s

Keynes was a monetary reformer who rejected the liberal financial order of the pre-Depression years. He sought to provide the world with a soundly managed monetary system. In doing so he developed his theory of the operation of a monetary – credit-based – economy, published in 1936 as the *General Theory of Employment, Interest and Money*.¹⁵ Keynes argued that the level of employment and activity in an economy depended critically on the rate of interest. Prerequisite to a prosperous and just society was a low rate of interest. A low rate of interest permits private industry to thrive. For capital investment projects to expand, activity depends on affordable finance, and affordable finance is cheap finance. Ecologically sustainable finance could also be cheap finance. Because if the cost of finance is halved, then a great deal more investment projects become viable, including renewable energy projects, public transport, and the like.

Equally, government expenditure can be freely extended if the interest burden is low. Under the advice of Keynes, from as early as 1931, governments around the world began to implement 'cheap money' policies. The Bank of England rate was cut to and fixed at two per cent, and debt management policy was used to

establish a structure of low interest rates across all types of borrowing. During World War II, when Britain borrowed more than it had ever done before, interest rates never rose above three per cent.

The international environment was aimed at enabling *domestic monetary autonomy*. Britain's domestic monetary policy was probably not appropriate for Australia, or even Austria. Exchanges were managed at fixed rates (according to purchasing power parity) by central banks using huge funds to buy and sell currency. Vitally, capital controls were implemented so that speculators could not undermine exchange or domestic interest-rate policies.

With great insight Keynes rejected the conventional economic thinking of the time, which held that markets were automatically rebalancing, so government intervention could only make things worse. He argued that economies could get 'stuck' in a depression, so governments had to use both monetary policy (interest-rate cuts) and fiscal policy (government spending) to put things right. When the UK economy slumped in the 1930s, the Bank of England refused to take decisive action, which is why it was nationalised in 1945 and remains today under some democratic control.

Keynes's policies permitted recovery from the Great Depression, underpinned the allied war effort and fostered the golden age of economic activity that prevailed until the 1970s.

It is common to regard the golden age of the 1950s and 1960s as the result of state expenditure, but that is only one side of the story. Low unemployment, high activity and prosperity across the globe were also the result of *private* activity. Nations produced what they consumed, with industry thriving and investing heartily. State budgets may have expanded, but they were under control and rarely substantially in deficit. International trade flourished but it was complementary, not prerequisite, to domestic achievement.

There is often a tendency today to see trade as the only route to prosperity for developing economies. But Keynes saw things differently. 'If nations can learn to provide themselves with full employment by their domestic policy', he argued, 'there need be no important economic forces calculated to set the interest of one country against that of its neighbours. International trade would cease to be what it is, namely, a desperate expedient to maintain employment at home by forcing sales on foreign markets and restricting purchases, which, if successful, will merely shift the problem of unemployment to the neighbour which is worsted in the struggle, but a willing and unimpeded exchange of goods and services in conditions of mutual advantage.'¹⁶

The golden age abandoned

Most of the world, including the poorest countries, experienced stability and growth during the golden age – a period when the finance sector was controlled under the system developed by Keynes. But financiers began increasingly to organise themselves to persuade governments to loosen their control.

In parallel with this, the international environment shifted to accommodate excessive expansion. Under the post-war Bretton Woods agreement, a trade imbalance was very much a constraint on domestic expansion. When imports grew larger than exports, there would be immediate pressure on the foreign exchanges and corrective action would be demanded. In 1971, in the wake of inflationary and exchange pressures arising from its own government-based expansions (not least the Great Society programme and the Vietnam War), the USA abandoned the international agreement that had prevailed throughout the golden age, and the constraint on nations' domestic expansion was removed.

These beginnings of financial liberalisation led quickly and inevitably to inflation and to the build up of financial and trade imbalances. Matters were compounded by oil price shocks, and then a vicious spiral of wage claims and price increases.

This was quite the reverse of Keynes's intentions. His low-interest policies were aimed at encouraging non-financial companies to extend capital investment and foster a revival in confidence. They were implemented in a highly regulated domestic and international financial environment, with capital controls and a much

smaller role for consumer credit than we know today. By abandoning these Keynesian constraints, the finance sector fuelled inflation (using an extraordinary sleight of hand to blame it on Keynes) and started down the long road to debtonation day in August 2007.

Tax havens and the credit crunch

The events since that day, dubbed 'the credit crunch', have changed the way the world perceives financial risk. It might have been unimaginable a year or so ago that there would be a run on a UK bank, or that the fifth-largest investment bank in the USA could disappear in a weekend. Both have happened. There is a pressing need for regulatory reform to ensure that the resulting transfer of risk to the public sector and taxpayers does not recur.

Part of this reform is, of course, specific. It must relate to the operations of the banks themselves. A bigger part is, however, systemic. Two major systemic faults contributed significantly to the failures that have occurred, and will occur again if change is not made.

The first systemic fault is to have allowed the operation of the 'secrecy spaces' that exist within the world's tax havens. The second has been to allow a system of accounting that has encouraged exploitation of the secrecy spaces that tax havens provide by preventing disclosure of their use by those entities most likely to default on their obligations.

It is widely assumed that tax havens exist to provide tax benefits. That is true, but only in part, and the false impression given by their name has been of some benefit to them. Tax havens should actually be termed 'secrecy jurisdictions' because their main purpose is to provide companies and individuals with hidden spaces in which they can conceal their abuse of the regulation of other countries, including countries in which they are normally resident.

The regulation they seek to avoid includes tax, of course, but as importantly it might include accounting disclosure, financial services regulation, banking regulation and even ownership information. Through tax havens the true identity of groups of companies and the transactions they undertake can be disguised. All these abuses are, perhaps, best epitomised by the offshore 'special purpose vehicle' used by many banks to place their liabilities 'off-balance-sheet' where can go unacknowledged. These have been extraordinarily popular structures for the management of securitised debt, the very issue that has now created the credit crunch.

Accounting rules have allowed this to happen. By letting companies create 'orphan' structures under the artificial ownership of supposed charitable trusts in tax havens (most of which have never paid a penny to any charity), the 'big four' auditors of the world's major banks: KPMG, PricewaterhouseCoopers, Ernst & Young and Deloitte have assisted in hiding obligations in this way. The structure of corporate reports, which allows all internal transactions within a group to be hidden from view, assists this process enormously. As a result of this accounting choice – for that is what it is – no one knows which company undertakes what activity in which country. Given that it is internal structures and transactions of multinational groups of companies that now pose so much threat to shareholder well-being, and to society at large, there is a pressing need for this secrecy space to be exposed.

We go on to set out our specific recommendations for reform of the global financial system in part two of this report. Before we do that, we need to consider the background to the two other legs of the triple crunch, beginning with climate change.

The climate crunch

'We underestimated the risks... we underestimated the damage associated with the temperature increases... and we underestimated the probabilities of temperature increases'

Sir Nicholas Stern, April 2008, referring to his 2006 report on the economics of climate change¹⁷

The evidence is now irrefutable

Our intention is not to provide a comprehensive review of reasons for concern about climate change. These reasons ought to be plain enough to anybody reading newspapers, let alone those who have seen the detail in the scientific journals. We will use a few remarks about consensus studies by large groups of scientists, and by various luminaries in the field of climate-change research, to make our point.

In October 2006 the UK Government's *Stern Review* predicted that the global economy could face a climate-change bill approaching £4 trillion if greenhouse-gas emissions are not cut deeply within the next ten years. Commissioned by the Treasury and hailed as 'the most comprehensive review ever carried out on the economics of climate change', it was edited by the former Chief Economist at the World Bank, Sir Nicholas Stern. Potential consequences predicted by Stern included turning 200 million people into refugees as their homes are destroyed through flood or drought.

Stern pushed for a follow-up to the Kyoto Protocol to be signed in 2007, three years before the 2010 deadline originally envisaged. He believed that one per cent of global GDP should be spent tackling the problem, to avoid costs up to 20 times higher if no action were taken. In the report he argues that 'if no action is taken we will be faced with the kind of downturn that has not been seen since the great depression and the two world wars.'

Stern also pointed to the opportunities afforded by the changes necessary. These are worth, according to one measure, well over £1 trillion.¹⁸ Stern's opinion of his 2006 work in April 2008 provides the quote leading into this chapter. Today, he believes the situation is worse than he and his huge team of experts thought.

In February 2007 the fourth and most recent Intergovernmental Panel on Climate Change (IPCC) Scientific Assessment Report created worldwide headlines with the theme 'worse than we thought'.¹⁹ The 'most likely' global average temperature rise by the end of century would be an estimated 4°C, thousands of scientists concluded. This could increase to up to 6.4°C when feedback effects (natural amplifications of warming stimulated by greenhouse-gas emissions) were taken into account.

The IPCC said a significant switch to clean and efficient technologies could cut the expected temperature rise by perhaps half. It would have to. A significant consensus exists among climate scientists that even a rise of 2°C could be catastrophic, economically and environmentally. Indeed, the EU has been negotiating at the climate talks since 1996 on the basis that the overall goal of the international community should be to keep the increase in global average temperature below 2°C. The rise to date has been 0.75°C. Three hundred delegates representing 600 scientists from 113 countries attended the final IPCC drafting meeting. In all, 2,500 scientists collaborated on the report.²⁰

A year after the fourth IPCC scientific report came out, a subset of the IPCC's top climate scientists identified nine areas in danger of suffering catastrophic collapse before the end of the century, unless greenhouse-gas emissions were cut deeply. They said it might already be too late to save the Arctic ice from melting in its entirety: it may be gone in as little as 25 years. They concluded that the Greenland ice sheet already faces a 50 per cent chance of unstoppable melting. The Amazon, where decreased rainfall threatens vast areas of forest, is next in line for devastation. The research, by an international team from many centres of climate research, appears in the proceedings of the US National Academy of Sciences. It includes a poll of more than 50 experts asked to rank the areas at risk.²¹

In March 2008, new British research suggested that the models used by the IPCC for its fourth assessment had underestimated climate sensitivity. A group at the University of Exeter found evidence that carbon dioxide, the main greenhouse gas, is more sensitive to temperature than previously thought. The mainstream IPCC estimate had the heat-trapping gas characteristics of carbon dioxide driving temperature. But the reality is that higher temperatures will in turn drive more carbon dioxide into the atmosphere as drying soils, dying forests and warming oceans release the gas. The Exeter researchers believe that 4°C of warming will drive a further 160 parts per million (ppm) of carbon dioxide into the atmosphere, in addition to the 380+ ppm already there. If they are correct, this would mean that mainstream climate damage projections may be underestimated by as much as 50 per cent.²²

In April 2008 Nasa's top climatologist, Jim Hansen, said feedbacks such as those described by the Exeter group mean the sensitivity of the climate to the heat-trapping abilities of greenhouse gases is twice the IPCC estimate. He called for a global effort to stabilise atmospheric carbon dioxide at 350 ppm – well below current levels. This would entail huge and rapid reductions in emissions and some physical removal of carbon dioxide from the atmosphere, too.²³

In May 2008, scientists released the atmospheric CO₂ measurements for 2007. The concentration rose more than two ppm for a fourth year out of the last six: worse than feared. The annual figure this time was 2.14 ppm, and the total atmospheric concentration is now 387 ppm. Between 1970 and 2000 the rise was a steady 1.5 ppm. Since 2000 it has averaged 2.1 ppm each year. Scientists think the steepening rate is due to three things: accelerating coal use in China (perhaps half), growth of the global economy generally, and a weakening of sinks as forests, seas and soils lose their ability to absorb carbon dioxide. Feedback accelerators, in other words, are beginning to make their mark in the atmospheric concentration of carbon dioxide. 'Beginning' is the word to focus on here.²⁴

The need for mobilisation as though for war

Perhaps unsurprisingly, climate change is now increasingly seen more as a security concern than a scientific issue. Just one impact – the melting of the Greenland ice cap – could have an impact on the UK (or any other) economy far worse than an invading army. If it destabilises and collapses into the Atlantic Ocean in its entirety, global average sea levels will rise by seven metres, flooding the coastal plains where most economic activity concentrates.²⁵

At the height of his international renown, the former UN weapons inspector Hans Blix asserted that climate change was a greater threat to humanity than international terrorism. Several others echoed this sentiment including former senior IPCC member Sir John Houghton, former UK Government Chief Scientific Advisor David King, and Prof. Stephen Hawking. Hawking wrote: 'The West should have a war on global warming rather than a war on terror.'²⁶ Going further still, UK Air Chief Marshal Sir Jock Stirrup said that climate change would fuel conflict and terror around the world.²⁷

In April 2007, the UK Foreign Secretary, Margaret Beckett, gave a lecture invoking one of the most iconic and resonant political phrases of the last century, and a touchstone of the US–UK 'special relationship'. The theme and title she chose was 'Climate change – the gathering storm'. Referring to World War II, she said: 'It was a time when Churchill, perceiving the dangers that lay ahead, struggled to mobilise

the political will and industrial energy of the British Empire to meet those dangers. He did so often in the face of strong opposition and not always with success.

In the end it was his foresight and his determination to prepare for a threat which – to many – was still seemingly distant and uncertain that in the end guaranteed the liberty and indeed survival of my country and that of many others. Today politicians and business leaders alike once again face an increasing danger to our security and prosperity, and growing calls for early and resolute measures. Climate change is the gathering storm of our generation. And the implications – should we fail to act – could be no less dire: and perhaps even more so.²⁸

When Stavros Dimas was appointed European Commissioner for the Environment, his reputation was as an advocate of unregulated market economics. Exposed to the realities of climate change, he was soon calling for the effort of a war economy: a notion imbued with all the political parameters and market intervention that such a project entails. 'Damaged economies, refugees, political instability and the loss of life are typically the results of war. But they will also be the results of unchecked climate change,' said Dimas in January 2007. 'It is clear that the fight against climate change is much more than a battle. It is a world war that will last for many years... It is like a war because to reduce emissions something very like a war economy is needed.' And, such an effort, he said, could bring public health benefits, just as it did in Britain in the 1940s.²⁹

There is a growing consensus that climate change demands an economic mobilisation of clean-energy technology, and other anti-greenhouse measures, on a scale to rival war time. We will examine ways to achieve this in part two of our report. But first, we need to consider another reason why such a mobilisation will be needed, even if by some amazing means the vast majority of the world's climate experts have significantly over-estimated the threat of climate change. It has to do with oil and gas depletion.

The coming global energy crunch

'As oil flirts with prices that call to mind the shocks of the 1970s, the usual Cassandras have been warning of dwindling oil supplies and sky-high prices. But the danger is precisely the opposite. The next two decades will witness a prolonged surplus of oil, which will damp prices down. This world of cheap oil will have serious political reverberations... The world should worry less about a scarcity of oil than about a glut.'

Amy Myers Jaffe and Robert A. Manning
Foreign Affairs, January/February 2000

"We can't continue to make supply meet demand much longer... It's no longer the case that we have a few voices crying in the wilderness. The battle is over. The peakists have won."

Former US Energy Secretary, John Schlesinger

Growing concern about premature peak oil

As players in the global economy wrestle with the emerging credit crunch, and wonder how badly the impacts of climate change will affect them, they tend to expect several decades of growing supplies of generally affordable oil. Some are more bullish, as the opening quote of our chapter illustrates. Almost every corporate and ministerial plan is geared to the assumption in that quote: that despite current high prices, supplies of oil will continue growing, continue to meet rising demand, and do so at generally affordable prices.

Peak oil is the point where further expansion of global oil production becomes impossible because new production is fully offset by production declines. Beyond this point, the world will face shrinking supplies of increasingly expensive oil. That is a manageable proposition if the peak is several decades away. It is a major problem if the peak is imminent. Growing numbers of people well qualified to offer an opinion fear that it is indeed imminent.

The IEA has been dismissive of the concept of peak oil for many years, but in its 2006 *World Energy Outlook*, it blew a whistle for the first time. Non-OPEC oil production will peak within a few years, the IEA concluded, and then the world's ability to match growing demand with supply will depend on three countries lifting their production significantly: Saudi Arabia, Iran and Iraq.³⁰ The IEA does not seem to think they can do it. According to the former IEA Secretary General, Claude Mandl, the world is on an energy path 'doomed to failure'. In July 2007, the IEA predicted an oil crunch by 2012. 'Oil looks extremely tight in five years time', said the IEA's *Mid-Term Market Report*, which predicted 'prospects of even tighter natural gas markets at the turn of the decade'.

The IEA forecasts OPEC crude capacity at 38.4 million billion barrels in 2012, up from an estimated 34.4 million barrels a day in 2007 but 'below OPEC's own

estimates of near 40 million barrels a day for 2010' As one peak-oil expert said, looking at the headline 'World will face oil crunch in five years' on the front page of the *Financial Times*: 'Make a note – 10 July 2007 was the day they announced peak oil was real.'³¹

During 2007, the chief executives of two major oil companies, Total and Conoco-Phillips, joined the whistleblowing. Global production sits at around 85 million barrels a day, but the IEA says it needs to reach 116 million by 2030 if projected demand is to be met. Total's Chief Executive, Christophe de Margerie, believes that production is unlikely to rise above 100 million barrels a day. 'A hundred million is now in my view an optimistic case,' he said. 'It is not my view: it is the industry view, or the view of those who like to speak clearly, honestly, and not... just try to please people. We have been, all of us, too optimistic about the geology.'³²

Another man with an opinion worth considering is Sadad al-Husseini, who supervised the largest reserves in the world as Saudi Aramco's Head of Exploration and Production until 2004. In December 2007 he told a conference in London that the peak of global production is already here. 'We are already three years into level production', he said.³³ He believes the level of production can be held up for a long time, but at the 2007 annual conference of the Association for the Study of Peak Oil and Gas, a succession of industry insiders voiced their concerns that a peak is imminent. Predictions fell in the range from the present to around 2015.

Former US Energy Secretary John Schlesinger summed up the situation, as he saw it: 'We can't continue to make supply meet demand much longer', he said. 'It's no longer the case that we have a few voices crying in the wilderness. The battle is over. The peakists have won.' If he is right, it is a remarkably hollow victory.

In the hundred-year-plus history of oil exploration, a little over 500 giant fields have been found. We call them giant because they hold 500 million barrels or more. That sounds a lot but it is less than a week's global supply at current demand levels. The peak of discovery of oilfields, giants or otherwise, was in the 1960s. It is not as though the industry has been hard up for cash to finance its exploration programmes. It is looking, and not finding. Or rather, it seeks elephants and generally finds mice. The average size of oilfields discovered since 2000 is a mere 20 million barrels, less than a quarter of a day's global oil supply.³⁴

Petroleum Review, a flagship oil-industry journal, regularly charts all the major oilfield projects. Its sums show that new oil coming on stream from the 'megaprojects' will drop significantly in 2011, to well below the rate at which existing reserves are falling, as oil is extracted. This assumes there are no more time slippages in the major projects. The industry had better find some new oil fast, because 2011 is just three years from now. But here is the problem. The average time from discovery of an oilfield to production is more than six years.

If global production flattens off on a plateau that will be bad enough for our oil-addicted global economy. But if there is a rapid decline after a peak, as has happened in many individual countries like the USA, then we have a massive problem on our hands. Nearly a quarter of the world's oil is pumped from the 20 biggest fields in the world, and most of these were discovered decades ago. The average age of all producing fields today is around 36 years. Production in several of the top 20 is falling fast.

Rapid decline rates can be seen not just in individual giant fields but in 'provinces': the official term for groups of oilfields set in one continuous regional geological structure. The North Sea was the last oil province to be discovered, back in the 1960s, and production peaked there in 1999. Since then the rate of production decline has surprised the industry. It was seven per cent last year, and production continues to fall fast despite rising investment.

Much will depend on production in Saudi Arabia, the second-biggest producer in the world after Russia. Production fell by eight per cent in 2006 and has not lifted in 2007 despite many pleas to increase output in order to bring the rising oil price down. Pundits debate whether this is due to national peak oil or the result of a strategy to maximise prices. While the pundits argue, Aramco is reportedly pumping

seven million barrels of saltwater a day into Ghawar, the world's biggest oilfield, to hold production up. Matt Simmons, a Houston oil banker, argues that this shows that the fields are in a bad state, heading for imminent production collapse. This is in the nation that the world most depends on if global supply is to continue to meet global demand. The four biggest Saudi fields are all more than 50 years old. Eight Saudi fields are carrying 90 per cent of the production. Worryingly, Sadad al-Husseini calculates that the giant fields of the Arabian Gulf are an average of 41 per cent depleted.

The news becomes worse when we scrutinise supposedly proven reserves. Oil reserves, being defined as the amount of oil economically extractable (from a field, region or nation) tend to be in the eye of the beholder. When the oil price goes up appreciably, it might be reasonable to argue that the amount of oil extractable economically increases with it. The Securities and Exchange Commission does what it can to define and apply rules for the calculation of reserves, at least for oil companies quoted on the New York Stock Exchange.

In the OPEC nations, where the national oil companies tend not to be quoted on stock exchanges, there are no such rules. In the 1980s many OPEC nations announced that they had much bigger reserves than they had earlier declared. They did this at a time of low oil prices, which ought if anything to have been shrinking reserves.³⁵ Many experts believe that this mass inflation of the figures happened not because they found more oil, but because OPEC began in 1983 to link its production quotas to the size of national reserves. As a result of this political game, the world's supposedly proved reserves of 1,200 billion barrels are probably overstated by at least 300 billion barrels.³⁶

Kuwait was the first country to decide it had bigger reserves than it had earlier calculated. From 1980 to 1984 Kuwait declared 64–65 billion barrels of proved reserves each year. In 1985, it declared 90. It has announced 'proved' reserves of 92–100 billion barrels each year ever since. The jump in 1985 was the subject of a certain amount of sceptical speculation. In January 2006 *Petroleum Intelligence Week* reported that it had seen national oil company documents suggesting that Kuwait has been overstating its proved reserves by more than half. In May 2007, after much wavering, the Kuwaiti Oil Minister confirmed the revelation. He announced that the nation's proved reserves would have to be written down, from 100 billion barrels to 48 billion.³⁷

It is clear that Kuwait hasn't been alone in playing political games with its declarations on oil production. Sadad al-Husseini himself is now on record as saying that global proved reserves are overstated by 300 billion barrels. This is a lot of oil: ten years of production at today's rate. The figure for phantom reserves could easily be higher than 300 billion barrels.

The peak production sceptics

The optimists in the oil companies make much of their ability to lift production in existing fields with a variety of enhanced oil-recovery techniques. These include pumping fluids or gases underground to ease the movement of oil through the pores of a reservoir, and drilling horizontally. It is true that they can lift ultimate recovery from a field dramatically, sometimes by 30–70 per cent or more. But most of these techniques are already deployed in the majority of the areas to which international oil companies (IOCs) have access. However, 80 per cent of the reserves are controlled by national oil companies (NOCs). While it may be true that enhanced recovery offers a route to a lot more oil in these countries, given that many NOCs don't have the technological capabilities of IOCs, and most of their governments are not about to let the IOCs in.

Even if they could secure access to the choicest remaining easy oil, the IOCs have the inauspicious example of the USA to contend with. Here, in and around Houston, many of the techniques of enhanced oil recovery were invented, tested and first applied. Production in the USA peaked in 1970, and has fallen steeply ever since, despite every effort to use reserves-enhancement techniques to slow the collapse.

Those who don't pay much attention to flow rates tend to be easily impressed by the Canadian tar sands. It is true that there are vast amounts of oil locked up there, and certainly hundreds of billions of barrels of it are accessible in principle. Hence all the headlines about Alberta being the next Saudi Arabia. The trouble is that the oil is solid, not liquid. It has to be melted, mostly underground. That takes vast quantities of gas and water. Even then, progress is painfully slow. The oil industry has invested \$25 billion to date, and after decades of effort has a production capacity of little more than one million barrels a day at present. Industry estimates now put production in 2015 at little more than 2.5 million barrels a day.³⁸ How can that make much difference? The current depletion rate of existing reserves is around 4.5 million barrels a day of capacity. Recent discoveries and enhanced oil recovery are just about replacing that today. But *Petroleum Review* has shown that as new oil supply begins to drop, the gap between expectation of production and reality will widen fast.

The oil shales of Wyoming and Colorado are also held up by some as a great hope for the future. In this type of unconventional oil, organic matter has yet to cook to the level where it forms either crude or tar. As in the case of the tar sands, there is plenty of 'oil' there in oil shales, if it can be cooked underground. But how to cook it? Whether there is any realistic technique for doing so, or if so on what timescale, remain open questions. One Shell proposal involves drilling wells into the shale and installing electric heaters to raise the bulk temperature to the level needed for reactions that produce light crude: 370°C. Another, from a US Government engineer, involves installing nuclear reactors underground.

This is the realm where desperation meets fantasy. 'Major technical challenges' remain, industry literature tends to say. Meanwhile, the new Shell adverts proclaim 'Say no to no', which is perhaps what the Board expects of its own executives. But as US Government officials asked at one recent industry-and-government conference behind closed doors: 'Where are you going to get the water, and the permits?'³⁹

Nazi Germany, hard up for fuel in World War II, resorted to extracting liquid oil from coal. This can be done by pulverising the coal, and passing gases across it at high temperatures. This is such an energy-intensive and filthy process that since the war only oil-strapped apartheid-era South Africa has followed the Nazi example with any seriousness of intent. At the time of writing, however, the first Chinese coal-to-liquids plant is due to open within weeks. The plant will be the first of its kind in the world, and the IEA reports that coal-to-liquids plants are planned in Japan, the USA, Australia, New Zealand, India, Indonesia, Botswana and the Philippines. Ominously, the US Air Force has flown a B52 on fuel made from coal. Converting and burning the liquid from coal emits twice the greenhouse gas of diesel. Of the 30 or so plants underway around the world, only one (in Australia) plans carbon capture and storage.

The Chinese seem schizophrenic about their plans. In August 2006 the Chinese Government announced that it intended to rein in coal-to-liquids production. Only a million barrels a day would be produced by 2020. In June 2007, China reportedly considered halting coal-to-oil projects due to worries about energy and expense. The official Xinhua News Agency reported an official of the country's top economic planning agency, the National Development and Reform Commission, as saying that China 'may put an end to projects which are designed to produce petroleum by liquefying coal'. The official also expressed concern about the expense and water demands of such projects.

Faced with this evidence of environmental constraints, and only pitiful rates of flow projected far into the future, it seems clear that the nastiest oil of all cannot come close to closing the oil depletion gap.

Peak oil: the end of large-scale oil exports?

If the early peak oil analysis proves correct, recent history in Kuwait, Iran and Russia suggests that the news might not be good for importers. When the news came out that Kuwait might have exaggerated its reserves, the parliament refused permission to expand production, arguing that the nation might need to

conserve resources for use domestically in building the national economy. In Iran, fears emerged in 2007 that domestic consumption had become so high that the nation's status as an exporter was under threat even without peak oil.

Iran's oil industry is labouring under the yoke of an aged and neglected infrastructure and facing the challenge of demand growing at up to 10 per cent per year. This suggests, according to some analysts, that as soon as 2015 Iran will no longer be an exporter. In July 2007 the Iranian Government brought in fuel rationing as a reaction to shortages caused by long-run domestic underinvestment in refining. Riots resulted, and in a foretaste of what awaits governments who fail to meet domestic expectations of oil supply, Iranians set fire to petrol filling stations. It will be difficult indeed for a government to export in the face of this kind of pressure at home, if domestic demand cannot be met.

In Russia, President Putin has openly pondered putting a cap on Russian oil production. From February 2006 to February 2007 production increased by over 400,000 barrels per day, whereas exports remained flat. The excess was needed at home, where Russian car production and sales grew prodigiously in 2006. The Russian use of gas as an instrument of economic blackmail during 2007 shows clearly the kind of treatment states dependent on fossil fuel exports can expect, should a global energy crisis materialise.

Hopes of OPEC coming to the rescue also received a blow in May 2008. The cartel said it wouldn't lift production, even if oil rises to \$200 a barrel. Meanwhile, fuelled by \$120 oil, the economies of the producers are booming, sucking up ever more of the oil and gas the importers will need.

Gas constraints: the other threat to UK energy security

There is every indication that gas, rather than coming to the rescue, will deepen the looming global energy crisis. In 2007, an American oil company's Chief Executive warned that 'the world has a natural gas problem'. Jim Mulva of ConocoPhillips thinks we face 'serious future gas shortages'.

As domestic oil and gas production collapses, the UK will be forced to look increasingly to imports. Britain imports only five per cent of its energy now, but that is likely to rise to 50 per cent in five years, much of it gas. The Government appears sanguine about this, pointing to the growth of domestic infrastructure for liquefied natural gas (LNG) and pipelines from Norway and the Netherlands. LNG is gas that has been converted to liquid to make it easier to transport. Britain has spent heavily to build the necessary infrastructure for such imports – and a new LNG capacity is being built at Milford Haven. But last year imports of LNG into the UK actually fell. As for the pipelines, in May 2008 Thor Otto Lohne, Executive Vice-president of the Norwegian pipeline company Gassco, sounded a stark warning at an energy seminar. Because of long-term contracts with continental European companies, he said, 'the UK is a secondary priority...like it or not, that is a fact.'⁴⁰

The implications of peak oil, and concerns about the security of gas supplies, are clear. The problem of the next global energy crisis is like the effects of the credit crunch, in that it will result in a dramatic drop in demand and a rapid rise in unemployment. These are political disruptions so severe that they will demand rapid action by governments. In political terms the message of the climate crunch is that we *should* change, whereas the short term, in-your-face necessity of dealing with the disruptions caused by the credit crunch and peak oil means that we *will be forced to change*. This thought provides the perfect place to draw to a close discussion of the triple crunch, and look at how to deal with its effects.

Part 2: The Green New Deal

Renewal of the financial system

'I sincerely believe that banking establishments are more dangerous than standing armies, and that the principles of spending money to be paid by posterity, under the name of funding, is but swindling futurity on a large scale'

**Thomas Jefferson, US president 1801–1809
and author of the Declaration of Independence**

'I am still waiting for a clear, audible mea culpa. The only good thing about this crisis is that it has made clear to any thinking, responsible person in the sector that international financial markets have developed into a monster that must be put back in its place....We need more severe and efficient regulation, higher capital requirements to underpin financial trades, more transparency and a global institution to independently oversee the stability of the international financial system. I have already suggested that the IMF assume this role.'

**Horst Köhler, German President and former
head of the International Monetary Fund⁴¹**

Virtually none of the economics practised today is relevant or helpful to the transformation of the economy at national, regional or global level.

The Green New Deal involves a dual approach. First, proposals for the renewal of the domestic and international financial system, including a changed regime of taxation. Second, proposals for state intervention to allow higher public and private expenditure – targeted at environmental projects that will dramatically cut fossil fuel use and hence help to tackle climate change and peak oil.

The transformation and re-regulation of the domestic financial system^{42,43}

Central to the transformation of national economies and the global economy will be the re-regulation and restriction of the international finance sector. Finance will have to return to its role as servant, not master, of the global economy: to return to its given role of dealing prudently with people's savings and providing regular capital for productive and sustainable investment.

Our initial proposals for financial renewal involve:

- The reduction of the Bank of England's interest rate to a low level.
- Very much tighter controls on lending and on the generation of credit.
- The forced demerger of large banking and finance groups. We want to see retail banking split from both corporate finance (merchant banking) and from securities dealing. This would echo the Glass-Steagall legislation of inter-war America, which separated retail and investment banking but was repealed in the 1990s.
- Breaking these demerged financial entities up into smaller banks, on the principle that mega banks make mega mistakes that affect us all. Instead of institutions that are 'too big to fail', we should aim for institutions that are small enough to fail without creating problems for depositors and the wider public.
- Subjecting all derivative products and other exotic instruments to official inspection. Only those approved would be permitted to be traded. Anyone trying to circumvent the rules by going offshore or on to the internet would face the 'negative enforcement' – their contracts would be unenforceable in law.
- Offering the same protection for our remaining top-class industrial companies as is routine in France or the United States – and perhaps go further.

Ultimately, our aim is an orderly downsizing of the financial sector.

Interest rates

This report recommends the adoption of low interest rates, hard-wired to credit and capital controls in order to limit any potential inflationary effect that would follow if they were offered in an unregulated market.

This is a critical component of the Green New Deal. Low interest rates mean that investments become significantly more affordable. We need massive new investment in renewable energy supply as part of the reaction that is required to the triple crunch we have identified as causing our current crisis. Put simply, an investment of £1,000 paid for over 20 years on fixed annual instalments at an interest rate of two per cent costs £61.16 a year or £1,223.20 to repay in total. At five per cent, these costs increase to £80.25 and £1,605 respectively, and at eight per cent to £101.86 and £2,037.20 respectively.

The impact of low interest rates is therefore very clearly seen. They are vital if viable green alternatives are to be made available. Put simply, they make it possible to secure investment into new sources of energy, the jobs that create those resources and the future of our planet. Without them all these things may be in doubt.

They have other possible benefits as well. Low interest rates allow the implementation of low-risk projects with a high probability of providing secure returns. They therefore ideally serve the interest of the most important group of savers; those who are saving for their retirement.

Our medium-term proposals for financial renewal involve:

Control over capital flows

Regulation of finance, and the restoration of policy autonomy to democratic government, implies the re-introduction of capital controls. These are vital if central banks and governments are to fix and determine one of the most important levers of the economy – the whole spectrum of interest rates; short and long, risky and safe.⁴⁴

The idea of introducing capital controls will either be greeted by a feigned yawn from neo-liberal economists ('it's all been tried before, and failed'; 'the world has moved on, electronic flows of money make controls impossible'); or else the sector will orchestrate public outrage, much as it did when Malaysia successfully introduced capital controls during the 1997 crisis. But the neo-liberals ignore entirely the global prosperity engendered by capital controls during the period referred

to as the golden age. The fact is that in a crisis, capital controls will inevitably be imposed.

In June 2005, the Bank for International Settlements, perhaps one of the most conservative institutions in the financial system, addressed the problem of global imbalances and suggested that the international financial system could 'revert to a system more like that of Bretton Woods'. It added that 'history teaches that this would only work smoothly if there were more controls on capital flows than is currently the case, which would entail its own costs.'

Such controls would not be hard to police. Large financial movements are tracked already by national authorities, in the name of 'anti-money laundering measures'. They use the technology that makes possible almost instantaneous money transfers and split-second dealings in cash and securities around the world. Moreover, there is a low-tech reinforcement for this high-tech equipment. Contracts or deals entered into in offshore jurisdictions, or anywhere else, in defiance of financial controls could be declared void in British law. This 'negative enforcement' is highly attractive. It requires no police; it relies simply on British courts not doing something, i.e. recognising and enforcing financial arrangements made without authorisation.

Both these methods of enforcement also give the lie to the objection that financial controls can work only with international agreement.

By imposing taxes and restrictions on capital and controlling flows in and out of their borders, governments will regain the power to exercise an independent monetary policy, to fix interest rates appropriate to the home economy. Capital controls will preserve domestic savings for domestic use. They will also help central banks to determine the full range of interest rates – short and long, real, safe and risky – and to end exchange rate volatility, which hurts the productive exporting sector.

Central banks have a range of capital controls in their armoury. These will be vital to any transformation of the global economy, as they are the instruments that enable central banks to fix rates of interest. Returning this power to government and central banks will in turn allow them to begin the process of re-regulating the creation of money and credit, by setting limits.

Reform of taxation

Much of the current debate in taxation focuses on two things. The first is how to secure taxes from itinerant people and capital. The second, which has captured many recent headlines in the UK, is how to tax foreign earnings remitted to this country.

We believe these are not the most important issues. What is of most concern is the right of the nation state to tax the economic activity that arises within it at rates that it considers appropriate. What is key is the right to autonomy and self-determination in matters of taxation, within a framework of international cooperation.

We should be debating how the return on capital invested in the UK can be appropriately identified and taxed, and what action can be taken to ensure that money earned in the UK is not taken abroad without tax being charged.

These are complex issues, and this discussion can only touch the surface of this issue. But we have six initial recommendations and one further point of over-riding urgency to recommend. These are:

1. We must do away with the overly generous UK tax relief on the interest paid on money borrowed in the UK but used to finance a foreign business. This is simply using the UK tax system to subsidise foreign operations, and that is absurd.
2. We need to commit to working with the EU on the Common Consolidated Corporate Tax Base. This should include moving towards agreed methods of apportioning profits that eliminate most profit being artificially relocated to tax havens from consideration when allocating profits to countries. It has been shown that the UK would be eight per cent better off if it used such a system of apportionment.⁴⁵

3. We need to know where companies are, and what they are doing in each location in which they operate. The UK must back a call for country-by-country accounting, which can provide enormous benefits by showing what global companies are doing and where in order to facilitate appropriate taxation. At the moment this kind of accountability of corporations to their host countries is absent. The tendency of capital to roam unfettered around the world has to be challenged.⁴⁶
4. We need a general anti-avoidance provision in UK law, to provide the flexibility to neutralise the more esoteric forms of tax planning as they happen, and not retrospectively.
5. We need to strengthen transfer pricing provisions on payments to offshore havens if it cannot be demonstrated that the intellectual property located there was generated in the place to which payment is made. This is key: intellectual property is not created offshore, it is relocated there. If intellectual property cannot be shown to have arisen in the place in which payment is to be made, then the UK should not allow tax relief.
6. We should abolish the domicile rule that so obviously makes the UK a tax haven.

One final, essential change is that corporation tax should be reformed so that small companies have a quite different, separate tax. Small firms that are not owned by public limited companies (PLCs) or entities registered outside the UK and that do not qualify as 'large' companies under company law probably account for 97 per cent of all UK companies. They need their tax burdens to be reduced in order to bolster economic activity. At present smaller firms are being hampered by rules created for the bigger companies that are responsible for most of the UK's corporate tax problems.

Tax hideouts and open accounting

Enforcing openness and disclosure in tax havens is a long-term challenge. They have deliberately created opportunities for abuse within the world financial architecture. They will resist reform. Accounting is, though, a clear target for reform.

The International Accounting Standards Board is fast becoming a world standard setter. If it did just two things, it could expose secrecy spaces for the common good. First, it should require that 'off balance sheet structures' be brought back onto the books. It should also require country-by-country reporting by all multinational companies. This country-by-country reporting must disclose where a corporation is, what it is called in that place, what trade it undertakes there, what tax it pays in the location, and what assets it locates there. Most importantly, the trading data disclosed should be for both third-party and intra-group transactions. The information should be provided for every jurisdiction in which the corporation operates, without exception for any reason.

If enacted, these reforms would, by default, become law in more than 100 countries in the world because International Accounting Standards Board proclamations have that effect. These reforms would shatter the secrecy of the tax havens of the world, transform the way liabilities are recorded in company accounts, and bring an end to much of the abusive securitisation that has gone on to date. They would also expose the workings of hedge funds and private equity operators, disclose the identity of those companies that are abusing tax rules, and expose the nature of intra-group trade and some of the governance risks inherent within it. The information collected would end much of the transfer pricing abuse that currently denies the developing world tax revenues greater than the cost of the Millennium Development Goals each year.

It has been rare to think of accountancy as a force for social good. But it could be. This is its opportunity.

Global debt cancellation

Because of the build-up of vast levels of personal, corporate and government debts since the 1970s, the need for redemption of these debts will be immense. After hubris must come catharsis. It is our view that societies might have to introduce a *global* 'jubilee' of debt cancellation – an extraordinary amnesty for debtors. The first purpose of such an amnesty would be to release millions of people, business enterprises and governments from the grip of parasitical creditors, draining them of every last asset. The second purpose would be to restore debtors to viability, enabling them once again to become productive and economically active.

The third purpose would be to restore order and stability to the balance sheets of the finance sector, whose livelihoods would not be immune to the effects of a severe and prolonged debt crisis. Without such a global jubilee, high-income Anglo-American economies could be mired in prolonged economic degradation caused by debt deflation for decades ahead – just as low-income countries have been mired in debts since 1982, and Japan in a deflationary environment since 1990. A prolonged crisis in rich countries will impact more severely on people in low-income countries. A global jubilee will release rich and poor countries alike from debt bondage.

The Green New Deal and public expenditure

Our Green New Deal relies for funding on a mixture of public and private spending financed by borrowing. Such borrowing is essential during a depression, when the government must intervene as the corporate sector shrinks. This government intervention generates employment, income and saving, and associated tax revenues repay the exchequer. This is the multiplier process, attributed to Richard Kahn, Keynes's closest follower.

Any public spending should be targeted so that domestic companies benefit, and then the wages generated create further spending on consumer goods and services. So combined heat-and-power initiatives generate income for construction and technological companies, and then workers' salaries are spent on food, clothes, home entertainment, the theatre and so on, creating demand for those industries.

The mathematics of the process are such that the public investment should create an exactly increased amount of *new* saving, rather than being a draw on *existing* saving.⁴⁷ Equally the higher level of saving as a result of public works will create demand for new savings instruments. This can be met with innovative government instruments, such as green savings bonds.

The same argument demonstrates that there is nothing wrong with reliance on public expenditure for a good part of national economic activity. The extent of that activity should be a matter for political and democratic choice, for it merely directs real resources into certain uses, while private impetus may direct resources elsewhere. The issue is surely complementarity of purpose and full utilisation of resource.

Facing the climate and energy crunches: lessons from history

'I have been charged with attempting to apply totalitarian methods to a free community. No criticism could be more misdirected. In a totalitarian state the problem of the distribution of sacrifice does not exist... It is only in a free community that the task of government is complicated by the claims of social justice... The aim of these pages is, therefore, to devise a means of adapting the distributive system of a free community to the limitations of war'

J.M. Keynes, *How to Pay for the War*, 1940

In this chapter we consider the lessons from past periods of having to face constraints: the experience of mobilising for war in the UK during the 1930s, and the 'special period' in Cuba. Then, in the final chapter, we consider a set of actions for the Green New Deal in its modern context of the triple crunch, and options for the financing of those actions.

How constraints drive innovation, problem solving and creativity: the World War II experience

Some unintended consequences of war, and how society reacts to it, can be positive. In Britain in the 1940s, war led to the empowerment of women, rapid technological advancement and a healthier nation. Infant mortality fell, and life expectancy for those at home increased against a background of rapid cuts in consumption. The use of private vehicles almost ceased entirely, and the use of domestic electrical appliances fell significantly as did overall household consumption. On the downside there were also profiteering, defeatism, bigotry, paranoia and bureaucratic incompetence (for example, more government effort seemed to go into planning the protection of national art treasures than the defence of the civilian population).⁴⁸ Our opportunity today is to learn the good lessons and to try to avoid repeating the mistakes.

The approach to curbing consumption during World War II was influenced by the experience of inflation and scarcity during the war of 1914–1918.⁴⁹ The task was to ensure a fair distribution of supplies, and also to foresee and obviate any difficulties. Ultimately, the public largely assented because it understood the need for action and for the restrictions. But it wasn't straightforward. Working at the height of his powers, Keynes struggled to find ways to cut consumption and increase savings. Luxury taxes were only introduced slowly and cautiously. Writing in 1940 in *How to Pay for the War*, Keynes coined his dilemma in the quote above in a way that resonates powerfully today, especially if we consider the possibility that oil and/or gas exporters will suddenly divert their exports to countries other than the UK, or keep their diminishing reserves for use at home.

Despite the eclipsing severity of World War II, many people in the UK experienced deceptively good times. Wages rose and employment grew. Consequently overall income increased substantially. This posed a question that will be relevant in the coming war against climate change: how to cut consumption of particular commodities that could make fighting the war more difficult.

The Government proposed higher taxes softened by the promise of 'post-war credits'. In effect, a form of compulsory saving was introduced, made more palatable by the prospect of greater future security. A National Savings Movement organised marches, processions and displays the length of the country. Propaganda was widely used – especially where rationing was difficult or impossible, such as with certain public utilities. There was also a huge focus on enjoying low-consumption good times. There were campaigns to holiday at home, and endless festivities such as dances, concerts, boxing displays, swimming galas, and open-air theatre – all organised by local authorities with the express purpose of saving fuel by discouraging unnecessary travel. Over the course of the war, spending on relatively 'weightless' entertainment went up, as classic consumption went down.

Initially the rationing of coal was held back in favour of a high-profile campaign promoting fuel economy. To lead by example, very public energy restrictions were introduced in government and local authority buildings, shops and railway stations. The result was successful and the drop in domestic coal deliveries by early 1943 was greater than the cuts previously planned in an over-complex rationing scheme. Petrol rationing, by contrast, was introduced early on and tightened to the point where rations were only made available for business and other essential purposes. The private car almost disappeared from the roads.

It's vital to remember that adapting was difficult even then. In the 1930s, people led sophisticated lives. A range of foreign food and other luxuries were taken for granted as much then as they are now – even if the selection was smaller. There was considerable disquiet when imported food disappeared almost entirely from the shelves.

Behind all the schemes to manage demand, the objective was to 'secure the fairest possible distribution of whatever supplies are available and to ensure... that as far as possible the things that everybody needs shall be within the reach of all'.⁵⁰

And rationing wasn't 'one size fits all'. There were special allowances for mothers and children; for agricultural workers and miners who lacked work canteens; for vegetarians who didn't take up a meat ration; for people with illnesses and others whose diet was conditioned by their religion.

Even outside the workplace 'communal feeding' was a big issue. 'British restaurants' became a national institution. By the end of the war there were over 2000 nationwide, run by a combination of voluntary organisations and local authorities, serving 600,000 meals per day.

Cuba: the success of the 'anti-model'

One country that is generally maligned in the Western media has already lived through the economic and environmental shocks that climate change and peak oil hold in store for the rest of the world. Does it have any lessons for us? Cuba's sudden loss of access to oil imports and its economic isolation were so extreme in 1990 – and its reaction to the shock so contrary to orthodox approaches, and so successful – that it was dubbed the 'anti-model' in Washington DC. While we may hope that most nations never have to face the same experience of rapid 'cold turkey', Cuba's relative economic isolation provides the closest thing we have to a laboratory example of adaptation to peak oil.

Following the collapse of the Soviet Union, Cuba lost its cheap supplies of oil. The country had become heavily dependent upon these for its transport, farming and wider economy, so the effect was disastrous.

At the same time it continued to endure one of the longest and most comprehensive economic embargoes imposed on any country. In one corner of the Caribbean, the USA refused to let the cold war thaw. Cuba's location, in the flight path of the annual hurricane season, means that the island also had to contend regularly with extreme weather events. By all accounts, Cuba should be a complete basket case – battered equally by the weather and its neighbouring superpower.

In the face of all these challenges, why isn't Cuba on a par with some of the worst failed states in the world? Why does it not have shattered health and education systems? Why do its people not starve or suffer endemic malnutrition? The answer can be found in a rigid and centrally controlled economy, government planning, preparation and the fact that challenges were tackled courageously and imaginatively.

Before the Soviet collapse, Cuba imported most of its needs. It exported sugar and tobacco to the Soviet Union at agreed premium prices, and received oil in return, some of which was re-exported. This set-up created distorting incentives for large swathes of land to be given over to export crops grown in industrial monocultures, heavily dependent on oil-based inputs. Just before the collapse, in 1989, three times more land was dedicated to sugar than to growing food.

Then oil imports dropped by over half, crippling the economy and slashing foreign-exchange earnings from the re-export trade. The use of chemical pesticides and fertilisers dropped by 80 per cent, sounding a death knell to industrialised farming. The knock-on effect on people's daily lives was dramatic. The availability of basic food staples, such as wheat and other grains, fell by half. The average Cuban's calorie intake fell by over one-third in around five years, leading to an average weight loss of 20 pounds per person.

But in contrast to the situation that many countries find themselves in today, Cuba was in a position to respond. Serious and long-term investment in science, engineering, health and education meant the country had developed human resources, a strong social fabric and the capacity to act. Before the 'oil shock', Cuba was already investigating forms of ecological farming far less dependent on fossil fuels. When the shock came, a system of regional research institutes, training centres and extension services was quickly put in place to support farmers.⁵¹

But the foundations were laid much earlier. Successive reforms dating back to the early days of the revolution in 1959 reduced inequality and redistributed the ownership of land. Though these were frequently and conveniently overlooked, Cuba achieved in little more than 20 years levels of literacy, health and nutrition that were the envy of the developing world. It achieved this in spite of the US economic boycott. An educated and healthy population were the foundations on which Cuba's miraculous survival were built.

Drawing on these strengths, the threat of serious food shortages was overcome within five years. At the heart of the transition after 1990 was a rapid shift to the use of biofertilisers and biopesticides, crop rotation and intercropping, and the use of animal labour and manure. In other words: a largely organic system. The success of small farms and of urban farms and gardens was also an important factor. Immediate crisis was averted by food programmes that targeted the most vulnerable people – the old, the young, pregnant women and young mothers – and a rationing programme that guaranteed a minimum amount of food to everyone.

It was the large-scale state farms that found the change hardest. Small-scale farms responded quickly, raising their productivity above previous levels. Following the success of the peasant-run small farms, state farms were turned in 1993 into so-called Basic Units of Cooperative Production: owned and run by their workers or as cooperatives. Land was later made available to anyone who wanted to start an urban garden farm.

Shortages and rising food prices made urban farming into a very profitable activity. It also proved highly productive. Once the state backed the urban farming movement, it grew rapidly. Lots of backyards in Cuban cities became home to food crops and farm animals – grown and reared almost exclusively along organic lines. Half the food consumed in the capital, Havana, is grown in the city's own gardens. Urban gardens provide 60 per cent of the vegetables eaten in Cuba.

The country's experience suggests huge, barely tapped global potential for urban farming. In Havana alone, there are more than 26,000 food gardens.⁵²

In a comparison that might be unwelcome to the current US administration, Cuba's recent experience both echoes and surpasses what America achieved in its push for 'victory gardening' during World War II. Back then, led by Eleanor Roosevelt, between 30 and 40 per cent of vegetables for domestic consumption were produced by the victory gardening movement.

Cuba's eventual transition to a more self-sufficient food system was far from smooth. But it demonstrated that it is possible to feed a population under extreme economic stress with very little or even no fossil-fuel inputs. And, as with war time Britain, there were unexpectedly positive outcomes.

Dramatic reductions in consumption, coupled with other dietary and lifestyle changes (people walked more) altered the health of the nation. As calorie intake fell by more than one-third, the proportion of physically active adults more than doubled and obesity halved. Between 1997 and 2002, deaths attributed to diabetes fell by half, coronary heart disease by 35 per cent, strokes by 20 per cent, and all causes of death by just under one-fifth.⁵³ These findings were published in 2007 in the *American Journal of Epidemiology* and carry a profound message about the potential benefits of reduced consumption.

The global food system is both fossil-fuel dependent and a major source of greenhouse-gas emissions. It is also, of course, vulnerable to climate change. Reduced human consumption could improve health, ease the burden we place on the planet's ecosystems and introduce much-needed room to manoeuvre in the face of external shocks. The *American Journal* authors comment: 'These results suggest that population-wide measures designed to reduce energy stores, without affecting nutritional sufficiency, may lead to declines in diabetes and cardiovascular disease prevalence and mortality.'⁵⁴

But it isn't only oil shocks and food crises that the country has learned to live with. Compared to the tragic debacle in New Orleans following the impact of Hurricane Katrina, Cuba's ability to handle climate-related disasters appears exemplary. It is something from which many, including the USA, could learn. Compared to the impact of Katrina in New Orleans, which killed over a thousand people and left lasting devastation behind, the 216 kph winds of Hurricane Michelle that hit Cuba in 2001 claimed only five lives – in spite of 20,000 homes being damaged.

Proper pre-disaster planning, with a collective approach managed by government but owned at the local level, saved lives and enabled communities to bounce back more quickly afterwards. As disasters expert Dr Ben Wisner commented on the evacuation of 700,000 of Cuba's 11 million population: 'This is quite a feat given Cuba's dilapidated fleet of vehicles, fuel shortage and poor road system.'

But in spite of its successes (and partly unintentional positive consequences) the Cuban approach thoroughly contradicts the model of development normally sponsored by the international financial institutions. It is highly managed, focused on meeting domestic needs rather than export-oriented, largely organic and built on the success of small farms. It is so different that it has been called the 'anti-model' by the World Bank, but with some startled respect.⁵⁵ At least one analyst suggests that the Cuban experiment 'may hold many of the keys to the future survival of civilisation'.

Even allowing for radical differences in history and geography, any politician peering into the future of energy shock, climate change, and rocky economic prospects would be a fool not to learn from how Cuba got it right. Its experience also supports a growing and much broader literature that describes the breakdown of the relationship between consumption and well-being, when consumption exceeds the point of 'sufficient' human needs being met.

The new well-being

The conflation of a growing economy with rising well-being in wealthy countries such as Britain has become a 'given' in conventional economic theory and the minds of policy-makers. To question it remains an economic heresy, punishable by excommunication from the company of the professional commentariat. But times have changed, and the theory is wrong. In the UK alone, while our economy has grown continuously over the past few decades, study after study shows that our sense of satisfaction with life has flat-lined. Similar trends can be found in a wide variety of other industrialised countries.

In the face of this seeming contradiction, what sort of indicator could better point the way ahead for policy? Basically, we need to assess the efficiency with which we turn fundamental inputs, in this case fossil fuels, into desirable and meaningful human outcomes – such as relatively long and satisfied lives. Standard, comparable data exist for all these factors and for most countries. Interestingly, for those who doubt the robustness of life satisfaction measures, these correlate closely with a wide range of quantitative data on health, depression and suicide. In other words, when asked in the right way, people do have a good idea of their overall well-being. Combining life expectancy and satisfaction produces perhaps the most fundamental indicator of human well-being, what academics refer to as 'happy life years'. By then adding resource inputs, either carbon alone or all resources measured by the ecological footprint, a measure emerges of the relative environmental efficiency with which societies deliver long and happy lives.

If we apply this analysis to Europe using carbon, a surprising and worrying picture emerges. All the talk is of successful knowledge-driven, resource-light, service economies. But European nations have become less carbon efficient, not more, in the way they deliver well-being for their citizens in terms of life expectancy and satisfaction. Europe is less carbon efficient now than it was in 1961.⁵⁶

Better news comes from findings that across Europe, and even more so within the UK, people report comparable levels of well-being whether their lifestyles are high consuming and very resource-intensive, or low consuming with a much smaller ecological footprint. The range of levels is enormous, from lifestyles that if followed by the whole world's population would imply the need for the resources of six-and-a-half planets like Earth, down to just the one that we actually have.

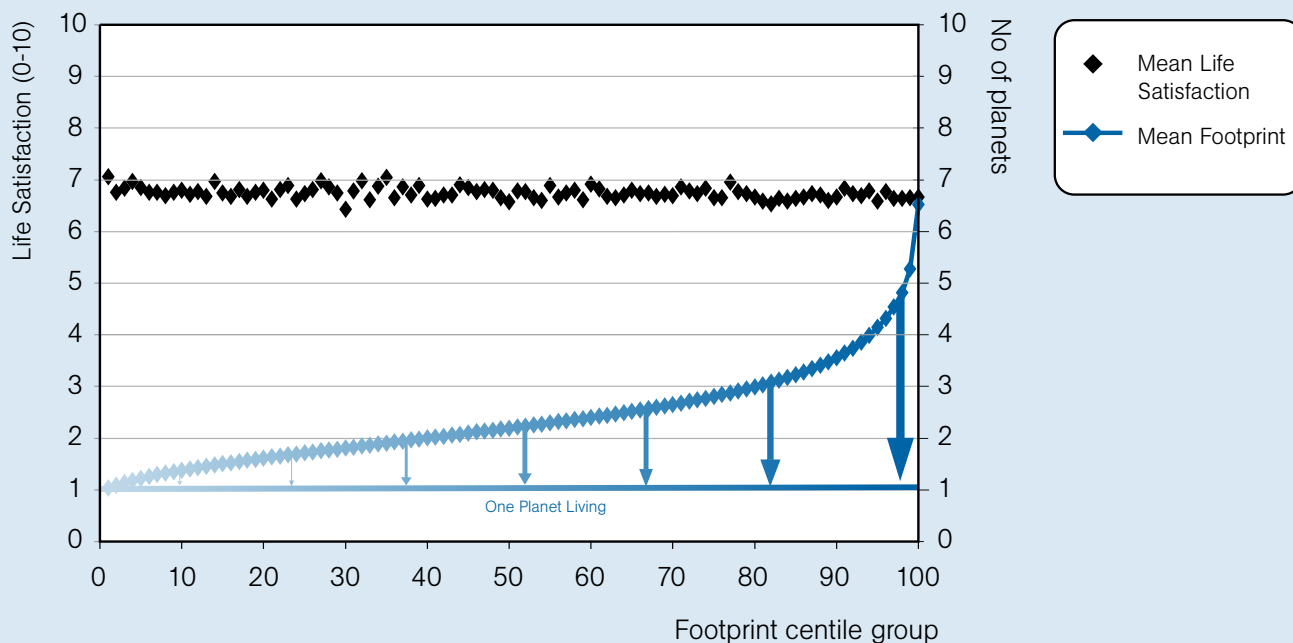
More interesting still is the snapshot of what lies behind different lifestyles found in Britain and across Europe. In a unique survey carried out by the new economics foundation, over 35,000 people reported their general, everyday levels of consumption and their levels of well-being.

When consumption was compared to different levels of life satisfaction, there was virtually no connection at all. You were just as likely to have a good life if you were thrifty, as you were if your ecological foot stomped around the globe all year courtesy of a 747 jumbo jet, or left its tread courtesy of the wheels of a luxury Bentley.

This is because at most European stages of economic development, when most basic material needs are met, other things determine the rise or fall of well-being. These include the quality of family life, friendships, and the opportunities we have to do things that give lasting satisfaction, such as learning, being engaged in creative pastimes and meaningful work.

More than this, there is now mounting evidence that getting caught on the hedonistic treadmill, chasing an ever bigger house or smarter car, will undermine our well-being. A more in-depth explanation of these dynamics can be found in the **nef**-edited volume *Do Good Lives Have to Cost the Earth?* (2008). These findings could be a message of liberation to policy-makers previously too terrified to tackle demand management.

Figure 1: Life satisfaction and consumption in Europe



An emerging consensus suggests that, at best, we have less than a decade to stabilise global greenhouse gas concentrations, before potentially irreversible changes to our climate begin to happen.

We need to re-engineer the economy at a scale and speed only previously seen during war time. To tackle the problems facing us, we need the equivalent of an environmental war effort.

Carbon messaging and action at home and abroad

Of course it has to be remembered that during World War II, restraining measures were accepted by the majority because there was a hope and expectation that this enforced frugality would end once the war was over. Fighting climate change, and coping with energy and food price rises and shortages, will be a battle with no imminent end in sight. In the case of climate change, the fight is bound to fail if other nations remain locked into fossil-fuel profligacy. This is where the interplay with the energy crunch is vital. Fossil fuels are finite, and conventional oil and gas will be increasingly tight in all countries, forcing restraint ultimately even in producer nations.

But there is much more coal left in the world than there is oil and gas, and a good deal of unconventional oil in the tar sands. If the world rushes to replace oil and gas with unsequestered burning of coal and tar sands, we will lose the climate change battle anyway.⁵⁷ Multilateral diplomacy is going to have to continue, and indeed be strengthened. The route to the low-carbon future will need to be global, and codified at the long-running and pretty ineffectual climate negotiations, whatever else happens. In this context, the setting of an example at home can only strengthen the hand of governments in the multilateral negotiating chamber. We explore this further in the next chapter.

When it comes to propaganda, which was used so effectively in the run up to World War II, two approaches will be needed, both in the UK and elsewhere. First, the constant contextualising of the latest adverse effect of climate change-related events; and second, energy and food shortages as the shape of things to come – unless a fundamental change in lifestyle takes place.

There is a sense already in British society that there is a 'gathering storm'. Although at present probably driven by nostalgia more than a sense of impending necessity, a market has emerged in reproducing war-time government information leaflets, such as *Make do and Mend* and *Sew and Save*, and some moving personal diaries of daily life on the home front. More materially, over one hundred Transition Town organisations have arisen from the grass roots in towns, villages and cities across Britain. These are essentially self-help organisations seeking to assist their communities to reduce their dependence on fossil fuels and increase their economic resilience. They are preparing in practical ways for the 'power down' entailed in the coming energy crunch, and the low-carbon living needed to fight climate change.

Anyone who has attended a Transition Town meeting can report on the spirit that exists to face up to the triple crunch. That, plus the lessons from our predecessors in the 1930s, and modern Cubans, should be an inspiration to us all as we consider the specific actions needed in the Green New Deal – the subject of the next and last chapter.

Facing the climate and energy crunches: policies and financing

‘There appears to be a danger that as economic conditions worsen politicians are preparing to abandon the green strategies that until recently were close to the top of their agendas. This would be disastrous... It is in the time of economic austerity that finding ways to increase efficiency of energy usage becomes most important.’

Sir David King, former Chief Scientific Adviser to the UK Government⁵⁸

What is the Green New Deal?

The Green New Deal entails re-regulating finance and taxation plus a transformational policy programme aimed at tackling the unemployment and decline in demand inevitable in the wake of the credit crunch. It involves policies and novel funding mechanisms to substantially reduce the use of fossil fuels. This in turn will help us reduce climate change and allow us to cope better with the coming energy shortages caused by peak oil.

A Green New Deal will to some extent replicate the three major planks of the original 1930s New Deal, designed to deal with the aftermath of the credit crunch of the late 1920s. These were:

1. Franklin Roosevelt's strict regulation of the cause of the problem – a greedy and feckless financial sector. This had been the major culprit in causing the Great Depression, made worse by governments thinking they had to let the market rule.
2. The provision of funding for infrastructure, part of which was paid for by an increase in taxes on big business and the rich – a measure which also had the positive effect of dramatically decreasing inequality.
3. The investment of billions of dollars in a wide range of infrastructural projects such as highways, dams and bridges, as well as in training and better working condition. Its purpose was to get people back to work and generate business opportunities.

The Green New Deal will, however, differ from its 1930s predecessor in that there will be a much bigger role for investments from private savings, pensions, banks and insurance.

Today's economic and business downturns, and consequent rises in unemployment, are not yet on the scale of the Great Depression. But we believe they will inevitably increase as debt-fuelled demand is curbed in response to the present credit crunch. To fill this deflationary gap the Green New Deal will encourage investments that are labour intensive, generate huge business possibilities and help solve the triple crunch all at once.

How will the Green New Deal help tackle climate change?

Using the methodology of the *Stern Review*, it has been estimated that the UK will need to reduce carbon emissions by 80 per cent from 1990 levels by 2050.⁵⁹

Several versions of how to achieve this target have been laid out. One ambitious carbon reduction programme that could meet this goal and also includes detailed costings was drawn up by the Institute for Public Policy Research (ippr). This envisages no new nuclear power, and that the result will be consistent with avoiding a 2°C increase in global warming, as long as all other nations instigate similar programmes.

Importantly, however, early action is necessary so that we are not left with impossibly high targets for carbon reduction as we approach the middle of the century. According to Kevin Anderson of the Tyndall Centre for Climate Change Research at Manchester University, for example, the UK needs to achieve year-on-year cuts in its greenhouse gas emissions over the coming decades in the region of 7 to 11 per cent, if it is to play its part in preventing potentially irreversible global warming. This is far, far beyond anything yet achieved in any modern, fossil-fuel dependent economy. It implies a radical departure from current policy approaches.

The ippr proposals would cost between £50 billion and £70 billion per year – roughly two-thirds of the present NHS budget of £105 billion per year. To put these figures in perspective, the Government receives £46 billion per year from gilts (bonds issued by the government), national savings and so on, and pension funds receive £50 billion in new contributions annually (their total worth being around £1,450 billion).⁶⁰

The ippr research concludes that it is cheapest and easiest to decarbonise electricity supply first, provided this is matched by increased efficiency and conservation for both suppliers and users. This will involve, for example, a massive increase in offshore wind and decentralised renewable, such as solar photovoltaics. Another key sector is buildings, responsible for 40 per cent of emissions. It is these two sectors that will form the bulk of the initial investments facilitated by the Green New Deal.

Thus a serious investment in building new energy-supply systems – including energy-efficiency, combined heat and power and renewables for millions of homes and other buildings – would amount to a £50-billion-plus programme per year. Interestingly these figures are close to what was spent by Roosevelt's New Deal. It has been estimated that between January 1933 and December 1940 \$21.1 billion was spent on public relief and federal works programmes. This amounted to about 3½ per cent of total GDP over the same period, and today would be equivalent to £50 billion a year in the UK (roughly \$500 billion in the USA).

Roosevelt's was a huge infrastructure programme aimed at employing four million workers. It paid for over 600,000 miles of roads, over 120,000 bridges, nearly 40,000 schools, 8,000 swimming pools and over two million public toilets. It also had a 'green' aspect. The Great Depression coincided with a wave of natural disasters, including the Dust Bowl and devastating floods. Roosevelt's New Deal included the Civilian Conservation Corps, which involved millions of Americans in wilderness preservation, promotion of health through outdoor recreation and a balanced ecology. These policies were the basis for the emergence of modern environmentalism in the USA.⁶¹

Regulation and market enablement

An effective Green New Deal approach will require a legislative framework backed up by price signals adequate to accelerate the shift to a low-carbon economy. Such signals should include rising carbon taxes and a price for traded carbon that is high enough to cause a dramatic drop in carbon emissions. Even more important will be a huge increase in investment in energy infrastructure.

To kick-start this policy transition, the Climate Change Bill should require regular annual emissions reductions on a pathway toward hitting a cut in carbon emissions of at least 80 per cent by 2050. This might not ultimately be enough, given the earlier discussion of atmospheric carbon dioxide concentrations. But it will send a signal big enough to energise efforts to accelerate low-carbon technologies. From there on we can realistically hope for a momentum that will get us on track for low or zero carbon well before 2050. There is already now a carbon race, ranging from car makers to supermarkets, as major industries compete to out-bid each other on

pledges to reduce emissions. Sweden has a plan to go zero carbon, using no fossil fuel, by 2020. The very near future will judge how much is warm words, and how much is seriously meant.

An all-encompassing programme, focusing initially on the goal of 'every building a power station', will involve traditional energy-saving measures such as insulation through to large-scale combined heat and power. It will also need a greatly accelerated uptake of renewable technology. The production and installation of these technologies will initially need substantial market-enablement support from the government. This has been the case in all big new technological transitions. The internet was originally developed and funded by the US military. In energy terms, renewables markets are growing very rapidly overseas, because of the generous subsidy approach of some governments (e.g. Japan, California) or policy innovations such as feed-in tariff laws (e.g. Germany, Spain), which have resulted in a large increase in the use of different members of the renewables family.

Germany combines these approaches. It provides low-interest loans for older properties to reach new-build energy standards. Its feed-in tariff programme ensures that anyone generating electricity from solar PV, wind or hydro gets a guaranteed payment of four times the market rate. This has created 250,000 jobs and demand is such that Bavarian farmers, with large barn roofs and fields, are the biggest customer group for PV in the world.^{62,63}

Financing the Green New Deal

At the heart of a successful programme to tackle climate change will be ever-rising fuel costs per unit of economic activity. A serious recession will cut energy demand and might result in a price drop, but we believe the imminence of peak oil, coupled with the need to make fossil fuels ever dearer to enforce climate-change agreements, will ensure rising costs per unit of economic output.

Rising fuel costs will allow ever greater profits to be made from investing in increased energy efficiency and renewables. It is the cost savings from moving out of intensive fossil fuel use, minus the cost of implementing energy-saving and clean-energy infrastructure, which will fund the repayment of loans made under the Green New Deal. Of course the more rapid the increase in carbon prices, the greater will be the incentive to invest, the potential profit from investment and the speed of transition to a low-carbon future.

Government funding for the Green New Deal could come in part from the increase in the Treasury's coffers from rapidly rising carbon taxes and carbon trading. Also now that energy prices are high, and before North Sea oil is exhausted, introducing a windfall tax on oil and gas companies would be a huge funding source. Fossil fuels are an unrepeatable windfall from nature, yet the UK Government has so far failed adequately to take advantage of its income from oil to prepare for a low carbon future. Norway, by contrast, has used its oil surpluses to help create a safety net for future generations that is today worth around €260 billion (£198 billion). This amounts to €75,000 (£57,000) for every man, woman and child in the country. The UK could follow Norway's lead and set up an Oil Legacy Fund, paid for primarily by a windfall tax on oil and gas company profits.

Part of these increased revenues would need to be used to raise benefits for the poorest people in our society, who would otherwise be too adversely affected by such price rises during the transition to a low-carbon future. Grants would be required to cover 100 per cent of the cost of changes needed to the dwellings of the most disadvantaged, to increase energy efficiency and fit renewables.

Public funding could be augmented by encouraging the use of private savings from individuals, pension funds, banks and other savings vehicles to invest in a government-backed Green New Deal. Savings in banks and building societies are at present guaranteed up to £35,000, and such a guarantee could be extended to a Green New Deal investment. This would carry the proviso that such funds would be earmarked solely for investments that reduce carbon use. Savers could also be let off taxes on gains from investment in carbon-reducing infrastructure, as is the case for infrastructural investment in the US municipal bonds market.

Other sources where citizens and institutional investors can provide funding for the Green New Deal include investment in 'green gilts' (government bonds), guaranteed not just in terms of an interest rate, but also in terms of their use to reduce carbon. Kiddies Go Green/Families Go Green/Grandparents Go Green bonds could be introduced and revitalise the fusty national savings industry.

Governments normally like to steer clear of the constraints put upon them by such hypothecation. However the *Stern Review* showed the level of serious disruption to the economy that will be caused by inadequate efforts to abate climate change, and this should render any such qualms redundant. On top of this, the energy crunch will focus minds on mobilising alternatives to oil and gas as fast as possible. There is a wall of money in pensions and other savings, plus a recognised need by the Government for people to save much more. Guaranteed investments via a Green New Deal programme will help provide the upfront funding needed for the low-carbon future.

Local authority bonds could be the major vehicle for the funds raised for this programme. In the USA, there is a \$2 trillion (£1 trillion) municipal bond market. Apart from Transport for London's (TfL's) recent successful £600 million bond issues, such an option is virtually non-existent in the UK. Yet this source of funding, and local democracy, could be promoted relatively easily if the returns on the money saved from the low-carbon investments, minus their cost, were used to repay such bonds. There are no legal constraints on local authorities raising funds through issuing their own bonds,⁶⁴ but it has not been encouraged by governments since the 1980s.

In November 2004, the Treasury authorised the Greater London Authority's TfL to issue bonds as part of its £2.3 billion borrowing to improve transport infrastructure. TfL is, in legal terms, a local authority. The first issue of the TfL bond in December 2004 easily raised the £200 million required, and in March and December 2006 two further bonds of £200 million each were issued at very competitive rates as the market became more accustomed to such issues.⁶⁵

Such local authority bonds could be spent on ensuring energy efficiency and providing renewable energy for each of the country's three million council tenants, as well as for all other local-authority-owned or -controlled buildings, such as town halls, schools, hospitals and transport infrastructure. Local authority bonds could be an investment route for pension funds and even individual savings to help fund such a crash programme.

For the private sector, encouragement for homeowners and those running factories and offices would need to take the form of subsidies towards the costs of energy efficiency measures and installing renewables – or tax breaks to carry out such work.

In 2007, the world invested over \$100 billion in renewables for the first time,⁶⁶ most of it private money. Hundreds of millions of dollars are flowing into venture-capital funds investing in renewables and other clean energy technologies as the oil price rises. Even if the hardest of times materialise as the triple crunch begins to bite, it seems a reasonable supposition that for the private sector, clean technology is going to be a relative safe haven.

Government action

The first thing that Government will need to do is put in place a national plan for a low-energy future and its provision on the ground. There is no such plan at present: no risk analysis of the peak-oil threat and no contingency plan for what would happen if oil and/or gas supplies collapsed rapidly. Such a plan would include oversight and coordination for generating the funding from Government, the energy industry and a range of private savings vehicles for investment in the multi-decade programme for the transition to a low-energy future.

There will be a need for a training, education, research and development programme for the 'carbon army' of workers needed to bring about a low-carbon future. To reduce carbon dramatically will require expertise ranging from energy

analysis, design and production of hi-tech renewable alternatives, large-scale engineering projects such as combined heat and power, and offshore wind at the high skilled end; though to medium and unskilled work making every building energy tight, and fitting more efficient energy systems in homes, offices and factories. A carbon finance sector will be needed to publicise, advise and put into practice the range of funding packages inherent in the Green New Deal. The advantage of the massive required scale of this energy transition will be that millions of jobs can be created. Thousands of new and existing businesses and services will benefit, and a large increase in tax revenue will be generated for the government from this new economic activity.

There will be vital resource-planning roles for government. Rapidly decarbonising a national economy will, in the long term, maximise energy security in the UK. The initial national planning for such a programme will have to consider, however, whether in the medium term there will need to be a guaranteed allocation of fossil fuels to ensure adequate energy for the transition to a low-carbon economy.

This will include energy for the production of the enormous amounts of materials, from steel to pipes, needed for renewable-energy generation and energy-saving products. It will also include ensuring the availability of the energy required to put in place a new regional grid system, ranging from large-scale wind, wave and tidal electricity to decentralised energy systems that increase domestic and local energy production. The same strategic allocation and reserve process might be needed to ensure adequate supplies of the raw materials needed, such as iron and aluminium.

International action

Looking beyond the UK, as Europe's economy slows in the wake of the US-initiated credit crunch, the EU could take a much-needed lead. The Green Alliance recently proposed a European budget for climate security that would involve Brussels re-orienting its public investment programme to set up a dedicated low-carbon fund for energy and transport infrastructure, an investment fund to help move China and India towards low-carbon economies, and a budget to help the poorest countries adapt to climate change.⁶⁷

A UK Green New Deal plus a large-scale European investment programme in cutting carbon emissions would demonstrate that rich countries are serious about tackling climate change. Were this to be combined with significant funds for poorer countries to cut their carbon output, this twin approach could be just what is needed to overcome the logjam that is bedevilling efforts to bring the developing world into an effective post-Kyoto agreement.

If our Green New Deal ideas are adopted in the UK, the Government will need to work hard to advocate similar policies and practices throughout the world. Appropriate trade and aid policies will be needed to support global progress towards a low-carbon approach. The multilateral climate negotiations will provide a useful platform for this, but the government will need to be vocal and active in other fora too.

Any global climate framework will have to guarantee both environmental integrity and a workable, global political solution. For this to occur it will have to display certain characteristics. As a minimum these are likely to include:

- *Setting a formal greenhouse-gas atmospheric concentration target.* A formal international target has been set in terms of limiting the average surface temperature rise to 2°C, but efforts are needed to keep the temperature rise as far below 2°C as possible. Anything beyond 2°C carries the risk of precipitating catastrophic runaway global warming.
- *Delivery of a fair, effective and equitable international agreement.* The agreement which will be drawn up to follow the Kyoto Protocol beyond 2012 must deepen emissions reduction targets in industrialised countries, allow for greater mitigation contributions from some of the larger developing

countries, and ensure a strong focus on adaptation. Wealthy industrialised countries need to do their fair share by setting legally binding, annual, constantly contracting carbon budgets. They need to plot a course, year by year, towards zero emissions.

- *Revival of an important dimension of the original spirit and intent of the UN Framework Convention on Climate Change (UNFCCC) – that developed countries should take leadership by reducing emissions at home.* In addition, poor countries must be given the opportunity to escape poverty through massive investments in adaptation and renewable energy and through greater flexibility in the rules governing the global economy on issues such as trade, finance and intellectual property.
- *Developing an alternative development paradigm, capable of delivering real poverty reduction in a carbon-constrained world.* This would involve extensive dialogue with, and active participation by, people in developing countries.
- *The recognition of forced displacement – in the form of environmental or ‘climate’ refugees due to global warming – within the Geneva Convention.* There needs to be flexibility in immigration policy, proper protection of displaced people and a compensation fund for those affected. Adaptation funds under the UNFCCC and Kyoto Protocol need to increase in size by several orders of magnitude, in order to match the costs of unavoidable adaptation and pay for clean-energy substitution.
- *Free technology transfer.* This is especially important in relation to energy technology, where developing countries should not be constrained by the restrictive regimes governing intellectual property in the global economy.

The potential for mobilising global pension-fund money

There is a further possible route for spreading the Green New Deal beyond the UK. This lies in the potential for mobilising the capital entrusted to the world’s pension funds to finance the investment required for environmental transformation.

Pension funds are not charities. They are governed by the obligation of fiduciary duty to pursue the best interests of their members rather than the ethical whims of their trustees. But two pressures are forcing pension funds to consider this duty anew. The first is the tightening regulation on pension fund disclosure and valuation across the Western world, which is prompting pension funds to more clearly match their liabilities (in terms of making out future payments to their members) with their mix of underlying assets. One recent study from a European investment bank estimated that tightening rules in the UK, the USA, France, Germany and the Netherlands would shift pension assets out of risky assets, such as equities, into relatively risk-free, long-term bonds to the tune of \$2000 billion.⁶⁸ At present, the supply of such long-dated bonds is relatively limited. This inevitably results in a downward pressure on bond yields, partially defeating the purpose of shifting into bonds.⁶⁹

The second pressure is that of climate change. Along with leading sustainable investors, many leading pension funds – such as ABP in the Netherlands, CALPERS in the USA and USS in the UK – have been at the forefront of efforts to encourage the investment community to acknowledge the systemic threat posed by climate change to their ability to pay out future pensions. As universal investors, pension funds deploy their assets across the market. This means their returns are an output of the wider economy. With climate change threatening to reduce global economic output by as much as 20 per cent, according to the *Stern Review*, pension funds face a further threat to their financial viability.

So far, leading pension funds have supported voluntary initiatives, such as the Carbon Disclosure Project, to raise awareness in the marketplace. Along with the UN Principles for Responsible Investment, such initiatives have served to drive up standards across a range of environmental and social issues. A number of institutions have also dedicated portions of their assets to specialist clean-energy funds – invested in both private and public equity.

The Institutional Investors Group on Climate Change has published ground-breaking research showing that incorporating climate change is now essential for effective investment strategies.⁷⁰ But no pension fund has yet digested the full implications of the 2007 climate consensus – that emissions need to be at least halved by 2050, with upwards of 80 per cent cuts in the industrialised world. The implications are clear: avoiding catastrophic climate change will require an unprecedented shift in investment capital by pension funds and other holders of long-term assets.

These twin challenges converge on a common solution. Pension funds have a rising demand for relatively risk-free assets to match their liabilities in ways that also avoid the severe threat of climate disruption and put their portfolios on the right side of the low-carbon transition. The solution lies in a new generation of Green New Deal-type 'climate bonds' raised by municipalities, national government and international financial institutions.

Timescale for a Green New Deal

We believe the Green New Deal will need to be debated, campaigned for and introduced in the next year. This apparently tight deadline is likely to become ever-more realistic because of the unavoidable need for Government to deal with the seriousness of unemployment and deflation resulting from coming economic downturn. In the year ahead, we predict that authoritative calls for action on peak oil will gather force. And of course, if the 'peakists' are correct, then we are most unlikely to proceed far into the next decade before the shock hits.

In addition, scientific opinion is now coalescing around the idea that we have less than a decade to start drastically reducing carbon emissions to prevent runaway global warming. So a crash programme of action needs to be put in place as quickly as possible. The more quickly it can be instigated and executed, the bigger the chance of making a soft landing once the full force of the triple crunch is washing over our economy.

Change is built into today's consumer-based, hi-tech economy. But rapid change outside of any meaningful human control is something different again. Responding to such unchosen demands for rapid transition is an art in itself. This is what faces us in the multiple crisis driven by energy shock, credit crunch and climate change, in which we can now include the emerging global food crisis.

In our living memory, the scale of economic re-engineering needed to prevent catastrophic climate change has only been witnessed in a wide range of countries during war time. No other approach looks remotely capable of delivering the necessary volume of emissions reductions in the time needed. In that light, we can learn from war-time experiences, positively and negatively. The best of those lessons can then be translated into our contemporary circumstances. As Churchill said, it is not enough that we try our best: we have to do what is necessary.

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