A SUSTAINABLE NEW DEAL

A stimulus package for economic, social and ecological recovery

Sustainable Development Commission

Foreword

There are always defining moments in the history of any dominant model of progress. It's hard to imagine how 2009 will not be seen, in retrospect, to be one of those moments. The combination of the severest economic recession since the 1930s, increasingly stark warnings from the scientific community about the risk of accelerating climate change, worsening environmental problems and resource shortages and the grave threat of widespread social disruption, leaves no room at all for business-as-usual mindsets or responses.

On a rather more modest scale, 2009 is also a defining moment for the current government. With little more than a year to run in its current term, it faces unprecedented challenges to its own credentials. But it is also presented with a unique opportunity to create lasting change and effect a vital transition to a sustainable low carbon economy.

It's against that backdrop that the Sustainable Development Commission has been developing its advice to Treasury and to Number 10 regarding the Budget on April 22nd. The 2008 Pre-Budget Report indicated some significant shifts in the direction of what we have called a 'Sustainable New Deal', but at nothing like the scale that is now required given such dire threats both to the global economy and to the global environment.

In short, this is a moment that demands unprecedented leadership, robust policy, and decisive action. This report sets out the framework for such a response, at a scale commensurate with the challenge, and provides a clear agenda for action. The economic crisis of 2009 has the potential to seed the economic opportunities of tomorrow. But it demands courage and vision today. That is our challenge to Government.

Tim Jackson, Economics Commissioner and
Jonathon Porritt, Chairman

Executive summary

On April 22nd, in the 2009 Budget, the UK Government has an unprecedented opportunity to bring forward a green recovery package that will transform the shape of the UK economy. This will make good, for the first time, on the extraordinary ambition levels to which this Government has committed itself over the last few years. Ministerial speeches at the Low Carbon Industrial Summit on March 9th could not have been clearer on that score.

"This transition to low-carbon is an environmental and economic imperative. It is also inevitable. There is no high-carbon future. Low-carbon is not a sector of an economy – it is an economy."

Lord Mandelson, BERR

"The science says we need to cut greenhouse gas emissions by 80% to avoid the most catastrophic and irreversible effects of climate change. We'll have 20% of current emissions, with an economy that we want to be three times bigger. It's not just a change, it's a transformation."

Ed Miliband, DECC

"We can now build a new green economy. Rise to one of the greatest peace time challenges of all, that will not only help our country prosper, but will build a better, more secure and more sustainable world."

Prime Minister **Gordon Brown**

The Sustainable Development Commission has been advising Government on both the scale and the scope of a proposed recovery package, and these are our principal conclusions and recommendations:

1 The Government should be prepared to commit up to £30 billion a year for the next three years on its green recovery package. This would represent around 50% of a total recovery package amounting to 4% of the UK's annual GDP.

2 We need to do this now to narrow the gap between ourselves and other OECD competitors. The total current commitment on green measures here in the UK amounts to 0.1% of annual GDP spread over three years. South Korea's green recovery package is 30 times larger, at 3% of GDP over the same time frame.

3 Without a commitment on this scale, there is every likelihood that the Government's low-carbon, sustainable measures will be totally overwhelmed by 'mainstream' (i.e. high-carbon and unsustainable) measures. Together with commitments made in the 2007 Comprehensive Spending Review, an investment strategy of the kind proposed would put the Government on track to achieving the extremely ambitious targets in the Climate Change Act.

4 The priority areas making up that package comprise:
- Upgrading existing housing stock
- Scaling up renewable energy supply
- Redesigning the national grid
- Promoting sustainable mobility
- Low-carbon investments in the public sector
- Skills for a low-carbon, sustainable economy.

5 Work in all these areas can start immediately, but over the next few years there will still need to be a major investment (by Government and employers) in skills for a sustainable, low-carbon economy. As both the TUC and employers have pointed out, it is foolish to go on willing the ends without willing the means.

6 More work will be needed on this, but provisional calculations suggest that a green recovery package of up to £30 billion a year for three years could create at least 800,000 jobs. More than 50% of the investments incurred under a programme of this kind would generate significant financial returns within a couple of years.

We are obviously aware of the fact that a 'Sustainable New Deal' of this scale and scope has significant implications for the Public Sector Borrowing Requirement. We have therefore argued that although there is now no alternative other than to fund such a package primarily through deficit funding in the first instance, it is crucial that the Government sets in place as speedily as possible a combination of alternative funding mechanisms including green taxation, green bonds and other 'invest to save' mechanisms.

In conclusion, the overall thrust of this document is clear: it is crucial for the UK to commit to a substantial recovery package for the UK economy, for the reasons spelled out many times by Government Ministers; at least 50% of that package needs to be focused on low-carbon and sustainable investments; this is the **only** way both to accelerate the journey out of the current recession, which will be painful enough anyway, and to avoid pitching us straight back into wholly unsustainable, consumption-driven, high-carbon growth. There is indeed no 'high-carbon future'.

And the Budget on April 22nd provides the obvious opportunity to stake out that critical strategic territory.

"Underlying all these measures is a common principle: the need to lay down now the infrastructure and the hardware to support a low carbon recovery and the green economy of the future."

Gordon Brown, Davos, 30th January 2009

1 Context

We are living through very difficult times. Global economic turbulence and the prospect of deep recession present an enormous challenge to government, to businesses and to households. But times of crisis are also times of opportunity, as the Prime Minister's Davos speech (cited above) affirms.[1] An unprecedented opportunity now exists to transform our economy and our society for the better.

A strong international consensus is emerging in support of a very simple idea.[2] Economic recovery demands investment. Targetting that investment carefully towards energy security, low-carbon infrastructures and ecological protection offers multiple benefits. These benefits include:

- freeing up resources for household spending and productive investment by reducing energy and material costs
- reducing our reliance on imports and our exposure to the fragile geo-politics of energy supply
- providing a much-needed boost to employment in the expanding 'environmental industries' sector [3]
- making progress towards the demanding carbon reduction targets established by the UK Climate Change Act
- protecting valuable ecological assets and improving the quality of our living environment for generations to come.

This paper sets out the SDC's position on the scope and scale of a green stimulus – an economic recovery package aimed at investment in the technologies and infrastructures needed for the transition to a sustainable, low-carbon society. The paper is framed around five key questions.

- How much has been committed to green recovery so far?
- What are the appropriate targets for green stimulus investment?
- How much should be spent on a green recovery package?
- Can this level of spending be justified in the UK?
- What are the likely returns in terms of jobs and other benefits?

The report summarises existing commitments to green recovery across the world and compares these to the green stimulus commitments in the UK. So far, it is clear that the UK lags some considerable way behind other countries in committing funds to green economic recovery.

The paper finds support for a strong emerging consensus on an appropriate target for such investments. As the Prime Minister has remarked, 'the contours of a resilient low-carbon recovery are becoming clear'. This 'green sweet spot' for investment includes retrofitting buildings (domestic and non-domestic) for energy efficiency, additional support for renewable energy technologies, encouraging sustainable mobility, modernising the electricity grid, and investing in eco-system protection and maintenance.

When it comes to the appropriate level of investment, the paper finds support for the view that up to 4% of annual GDP should be committed immediately to economic recovery. Estimates of the appropriate green content of this vary. Lord Stern has suggested a minimum of 20%. Green contributions across the world range from nothing at all to 80% of overall recovery packages. We present arguments here that at least 50% of

1 Remarks of Gordon Brown to the World Economic Forum in Davos, Friday January 30th 2009. Online at: www.number10.gov.uk/Page18201.

2 Initiatives include the American Recovery and Reinvestment Act (ARRA) 2009, UNEP's call for a global 'green new deal, the UK Green New Deal Groups 2008 report, work by the Deutsche Bank, the Aldersgate Group, HSBC Global Research, the Grantham Institute, the Center for American Progress, and elements of 'green stimulus' in economic recovery packages in countries as varied as China, South Korea, Australia and Denmark, including the UK's 2008 Pre-Budget Report and its forthcoming 'green industrial strategy'.

3 Globally, environmental industries are worth $4 trillion dollars already and are likely to expand by at least 50% in the next decade.

recovery packages should be devoted to green investments. **For the UK, this level of spending is equivalent to £30 billion per annum.**

There would be little point in this level of commitment if appropriate targets for funding could not be identified. There are some issues in the short-term in relation to implementation (and the appropriate skills training to achieve this). But the report finds clear evidence that across five target investment areas, a green recovery 'pot' could quite quickly become over-subscribed from legitimate calls for investment to meet key policy targets.

Returns from a green recovery package come in the form of direct financial returns (from energy savings), indirect returns to the economy from reduced emissions, greater energy security and improved quality of life, and social returns in terms of jobs.

In spite of these returns, there is clearly an issue for government in terms of raising this level of recovery funding. The report addresses four possible mechanisms for long-term funding of a green recovery. These include deficit spending, forms of environmental taxation, issuing green bonds, and models of energy service provision with a degree of public interest. In the short-term, the most likely route is through deficit spending. However, this option is clearly less favourable in the long-term and serious efforts should now be taken to explore the potential for the other three options.

In the UK, numerous calls for a green stimulus have already been made. Back in mid-2008, the UK-based Green New Deal Group published a landmark report calling for a concerted policy response to what they called the 'triple crunch' – the credit crisis, energy security and climate change.[4] The report stimulated much of the more recent thinking around a global Green New Deal.

Early in 2009, the Environmental Industries Commission, a trade association for the environmental technology and services sector, set out a series of proposals for a Green Growth Jobs Strategy which would support the environmental industry in the UK. These included a £10 billion 'Green Jobs Investment Fund' to create and protect some 200,000 jobs.[5]

More recently, a report from the Grantham Research Institute in conjunction with the ESRC Centre for Climate Change Economics and Policy, co-authored by Lord Stern, emphasised the case for greening economic recovery packages. 'A 'green' fiscal stimulus can provide an effective boost to the economy, increasing labour demand in a timely fashion,' the authors argued, 'while at the same time building the foundations for sound, sustainable and strong growth in the future.' The report also presents an informal 'ranking' of different policy options.[6]

Proposals for a green fiscal stimulus package have also come from the Local Government Association, and are currently being worked on by a range of environment NGOs, and by the Trades Union Congress. Green Alliance is developing a major new programme of work in this area, and WWF is working on proposals for the One Planet Economy.

The consensus emerging around the idea of greening economic recovery is a clear positive benefit to emerge from the global financial crisis. The Sustainable Development Commission therefore applauds the Gordon Brown's Davos commitment to a global 'green stimulus' and supports his intention to develop a 'low carbon recovery package' for the UK. As the Prime Minister himself remarked in a newspaper interview earlier this year, 'rather than [the recession] pushing the environment into a lower order of priority, the environment is a part of the solution.'[7]

4 A Green New Deal – published on behalf of the Green New Deal Group by nef (the new economics foundation), July 2008
5 EIC 2009. EIC's Growth Jobs Strategy: investing for the future. Policy Recommendations for promoting Britains environmental industries. London: Environmental Industries Commission.
6 Bowen et al 2009. An outline of the case for a 'green' stimulus. Alex Bowen, Sam Fankhauser, Nicholas Stern, & Dimitri Zenghelis,
7 'Tough lap for the marathon man' The Observer, 4th January 2009. Online at: www.guardian.co.uk/politics/2009/jan/04/gordon-brown-interview.

However, as the March 2009 report from the Environmental Audit Committee (EAC) on the Government's 2008 Pre-Budget Report demonstrates, there is currently a huge gap between levels of political exhortation and the reality of the Pre-Budget Report. The EAC is deeply concerned about the very modest scale of commitments in the PBR, the reluctance of Treasury to publish any assessment of the **overall** impacts on the environment of its fiscal stimulus package (in other words, showing the balance between the sustainable elements and the customary unsustainable elements), and its continuing failure to think again about green taxation. It concludes: 'Meeting our climate change and renewable energy targets will require a step-change in environmental investments. The Budget in 2009 should contain a much bigger and more coherent package of green fiscal stimulus.'

In that context, this report also addresses briefly the critical question of what happens beyond short-term recovery. Most analyses assume that the ultimate aim is to re-stimulate the kind of consumption-driven growth that has dominated the last few decades. As we have argued elsewhere, this goal is in the long-term entirely unsustainable without significant changes in both macro-economic structure and the social dynamics of consumerism. Our major new report on this *Prosperity Without Growth?* was published at the end of March.

In spite of this, it is clear that a green economic recovery of the form envisaged here is an essential first step in the transition to a more sustainable economy. There is now a unique window of opportunity to take decisive action in pursuit of agreed policy goals, and at the same time to put the UK economy on the path to sustainable economic recovery.

The purpose of this document is therefore to set out some of the parameters for an economic recovery package that puts sustainability at the heart of the UK economy. A key element is to address the financial scope of a green recovery package and an appropriate set of targets for it. In pursuit of that aim, we first present a brief comparative summary of proposed recovery packages across the world.

2 Green recovery – international commitments

How much has been committed so far?

Enormous sums of money have already been committed by governments in response to the economic crisis. By the end of last year, an estimated $7 trillion had been spent globally in underwriting toxic assets, recapitalising banks and attempting to restore confidence in the financial sector and stimulate lending. The cost of these financial rescue packages was driven largely by the size of the 'toxic asset' base and the perceived capitalisation needs of the banks.

Direct recovery packages have also been sought (and sometimes offered) in other sectors. For instance, the car industry has received direct support from government in both the UK and the US. The US government committed over $23 billion to bail out the ailing giants GM and Chrysler at the end of last year.[8] In the UK, the Government has promised to underwrite loans to the car industry totalling £2.3 billion.

Beyond financial rescue for specific sectors, broader economic stimulus packages have now been established in countries right across the world, including North and South America, Europe and the Asia Pacific countries. Their aim is to 'kickstart' the economy through a mixture of tax cuts, social spending and public investment. The total value of existing recovery packages is currently in the order of $3 trillion.

In principle, the potential exists for each of these different recovery measures to contain a 'green stimulus' component. Direct support for the financial sector, for instance, could be allied with conditions or investment vehicles to ensure that lending is preferentially targeted at sustainable investments.[9] Sectoral bailouts like those afforded to the car industry, could be made conditional on shifting towards greener manufacturing and low-carbon vehicles.[10]

Most obviously, the broader economic stimulus packages offer a clear potential both for green investment and for tax reforms to promote sustainability. Evidence suggests that this possibility is already being exploited by numerous countries across the world. As a recent HSBC Global Research report remarks, the 'colour of stimulus' is going green. Out of a total commitment of almost $2.8 trillion committed to economic recovery plans to date, $436 billion (15.6% of the total) can be characterised as green stimulus, according to the HSBC analysis.[11]

As Table 1 illustrates, the extent of green stimulus varies considerably across countries. Some plans still have no green component at all while others (notably China, the EU package and South Korea) incorporate green investment plans that represent a very substantial proportion of the recovery funding.

8 See eg, The Guardian, 30th December 2008. Online at: hwww.guardian.co.uk/business/2008/dec/30/general-motors-gmac.
9 This could include the establishment of 'green bonds' to promote sustainable investment, as proposed by Climate Change Capital and others.
10 Both the US and the UK car industry support packages have elements of this. £1 billion of the UK package is for investment in the development of green vehicles. See for example: http://news.bbc.co.uk/1/hi/uk_politics/7853149.stm.
11 HSBC 2009. *A Climate for Recovery. The colour of stimulus goes green.* HSBC Global Research.

Table 1: Green elements of economic stimulus plans[12]

Country/Region	Fund $b	Period	Green Fund $b	% Green
Asia Pacific				
Australia	26.7	2009–12	2.5	9.3%
China	586.1	2009–10	221.3	37.8%
India	13.7	2009		0%
Japan	485.9	2009–	12.4	2.6%
South Korea	38.1	2009–12	30.7	80.5%
Thailand	3.3	2009		0%
Subtotal Asia Pacific	**1,153.8**		**266.9**	**23.1%**
Europe				
EU	38.8	2009–10	22.8	58.7%
Germany	104.8	2009–10	13.8	13.2%
France	33.7	2009–10	7.1	21.2%
Italy	103.5	2009–	1.3	1.3%
Spain	14.2	2009	0.8	5.8%
UK	30.4	2009–12	2.1	6.9%
Other EU States	308.7	2009	6.2	2.0%
Subtotal Europe	**634.2**		**54.2**	**16.7%**
Americas				
Canada	31.8	2009–13	2.6	8.3%
Chile	4.0	2009		0%
US EESA	185.0	10 years	18.2	9.8%
US ARRA	787.0	10 years	94.1	12.0%
Subtotal Americas	**1.007.8**		**114.9**	**11.4%**
TOTAL	**2,796**		**436**	**15.6%**

The 'greenest' recovery package is South Korea where over 80% of the stimulus is targeted towards environmental goals. The funding is allocated to four main areas:

- conservation (low carbon vehicles, clean energy and recycling)
- quality of life (green neighbourhoods and housing)
- environmental protection (including flood defence) and
- infrastructure (IT and green transport networks)

Employment benefits are estimated to include the creation of 960,000 new jobs over the next four years. Interestingly, the government seems to view its Green New Deal as a way of placing South Korea at the forefront of 21st Century economies. Launching the package on the 6th January, South Korea's Prime Minister Han Seung-soo said: 'We are in an unprecedented global economic crisis. We must respond to the situation in an urgent manner... The Green New Deal will provide these. The 21st century global environment is here and we will find new growth engines for this era.'[13]

12 Source: *A Climate for Recovery – the colour of stimulus goes green.* (HSBC, February 2009)
13 Online at: http://english.mosf.go.kr/issues/policyissues/economic_view.php?sect=laws_policies&pmode=&cat=&sn=6280&page=1&SK=ALL&SW#4.

The largest overall commitment to a green stimulus comes from the Obama administration's American Recovery and Reinvestment Act 2009, which committed $787 billion in stimulus spending. Around $94 billion (12%) of this total can be characterised as green stimulus according to HSBC Global Research. This includes $26 billion for low carbon power (mainly renewables), $27.5 billion for energy efficiency in buildings, $4 billion for low carbon vehicles, around $10 billion for rail and $11 billion to upgrade the electricity grid. The aim is 'to create and save three to four million jobs, jumpstart our economy, and begin the process of transforming it for the 21st century'.[14]

To date, the UK lags behind these examples. A £20 billion ($28 billion) recovery plan was included in the 2008 Pre-Budget Report. A green stimulus component of £535 million (less than 3% of the total) was included in the package. This comprised £300 million for accelerated replacement of new railway carriages; £200 million (1% of the total package) for energy efficiency (mostly brought forward investment) in people's homes, and £25 million for flood defence and water infrastructure.[15]

The HSBC analysis counted an additional element of green stimulus through the car industry bailout which guaranteed £1 billion in loans for investment in low carbon vehicles, but no evidence is as yet available to justify such a conclusion. Even including this sum, the UK's green recovery plans amount at most to only $2 billion, or 7% of the stimulus spending so far (Table 1), near the bottom of the league of countries who have so far committed to the idea of a green recovery.

In summary, there is a wide and increasing level of support for the concept of a substantial green stimulus within economic recovery plans and considerable scope to expand the level of UK ambition in this regard. This would be entirely consistent with the Gordon Brown's own remarks to the World Economic Forum.

Commenting on the World Bank's $100 billion stimulus package for the developing world, the Prime Minister commented: 'I would hope and expect that up to $10 billion of this will got on a low carbon stimulus'. But this level of funding has yet to emerge in the UK Government's own recovery plans.

14 The American Recovery and Reinvestment Act of 2009 – Discussion Draft. Online at: http://appropriations.house.gov/pdf/RecoveryReport01-15-09.pdf.

15 *Facing Global Challenges: supporting people through difficult times.* Pre-Budget Report 2008. London: HM Treasury.

3 Targets for green stimulus spending

What should the money be spent on?

A striking consensus is also emerging on the appropriate targets for a green stimulus package. A key element in all the suggestions so far has been a focus on the transition to a low carbon economy. As the Prime Minister suggests in his Davos speech 'the contours of a resilient low-carbon recovery are becoming clear', not just from the proposals from a wide variety of observers but from plans being made on the ground in numerous countries.

Back in mid 2008, the UK Green New Deal group argued that stimulus spending should be focused on the twin challenges of climate change and energy security. Proposals included a vision for a low-carbon energy system that will make 'every building a power station' as well as 'creating and training a "carbon army" of workers to provide the human resources for a vast environmental reconstruction programme'.[16]

There is clearly a strong case for a stimulus focused on energy and carbon. Re-capitalising the world's energy systems for a low carbon world will be a major investment challenge over the next fifty years. The International Energy Agency's *World Energy Outlook* estimated that energy investment needs between 2010 and 2030 will be in excess of $35 trillion.[17] Bringing forward some of this investment and targeting it specifically at renewable energy, low-carbon technologies and energy efficiency could pay massive dividends later.[18]

UNEP's global Green New Deal has widened the remit of spending to include reinvesting in natural infrastructure: sustainable agriculture and ecosystem protection. Ecosystems already provide tens of trillions of dollars worth of services to the world economy.[19] So protecting and enhancing ecosystems is vital to economic productivity in the future, UNEP points out. They also call for substantial investments in clean technologies, sustainable agriculture and sustainable cities.

In a report published at the end of last year, the Deutsche Bank identified a 'green sweet spot' for stimulus spending, consisting of investment in energy efficient buildings, the electricity grid, renewable energy and public transportation. 'One of the reasons that the "green sweet spot" is an attractive focus for an economic stimulus is the labor-intensity of many of its sectors,' the authors claim.[20] We return to this claim in Section 6.

The Grantham Institute report makes a useful contribution by suggesting a range of criteria against which targets for green recovery should be assessed. These include:

- timeliness – the extent to which significant spending could be carried out within a year or so
- the potential for long-term social returns
- the existence of positive 'lock-in effects' in establishing low-carbon capital stock
- the likely extent of job creation and domestic fiscal 'multiplier' effects[21] and
- the use of under-utilised resources.

16 GND 2008, p3.
17 World Energy Outlook 2008 (www.iea.org/Textbase/npsum/WEO2008SUM.pdf). Reference scenario (business as usual) investment is $26 trillion. Achieving a 550 ppm stabilisation would cost $4.1 trillion more that this, and achieving a 450 ppm stabilisation would be add another $5.1 trillion to this cost.
18 Nicholas Stern's (2007) review on the economics of climate change, famously argued that for as little as 1% of GDP we could save ourselves costs as high as 25% of GDP later on.
19 In a paper published in 1997, ecological economists Robert Costanza and his colleagues estimated that the value of global ecosystem services amounted to around $33 trillion per year. At the time, the global GDP was only $18 trillion per year (Costanza et al 1997).
20 DB 2009, p4.
21 This refers to the potential for the stimulus to lead to private investment and household consumption demand over and above the original government spending.

As the HSBC report makes clear, not all of these factors are easy to assess. In particular, there are still significant unknowns in relation to the potential for job creation and possible multiplier effects. Indeed there is an urgent need for government to develop the capability to assess these effects properly.

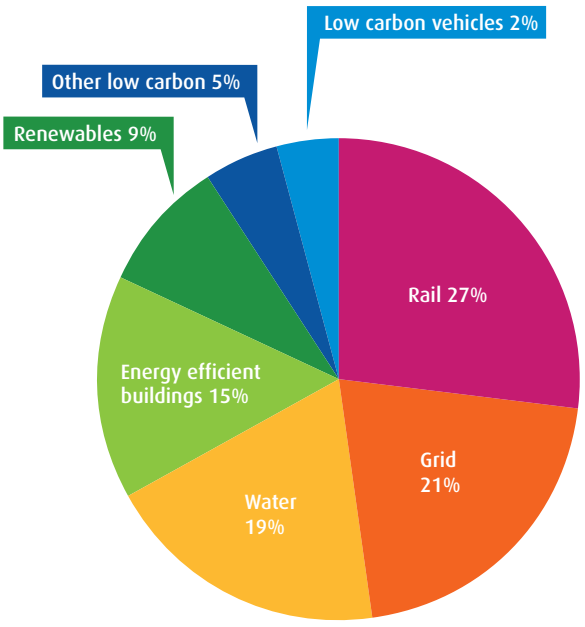
In the meantime, however, there are already 'good enough' answers to many of the questions – including, as we show in a later section, strong indications about the potential for job creation. Using the criteria in a qualitative way, the Grantham Institute report produces a useful evaluation of selected spending proposals. Numerous proposals rank highly against these criteria.

In particular, there are high-ranking options within each of the four 'sweet spot' areas: energy efficiency in buildings, renewable energy, the electricity grid and public transportation. Furthermore, the report identifies several other areas where proposals rank well against the criteria, including: boiler replacement, industrial CHP and ecosystem enhancement (afforestation eg).

When it comes to existing commitments, there is no hard and fast rule across the national recovery plans. Some countries have opted for more investment in transportation, others for more in building energy efficiency. A few have opted for expenditure in Carbon Capture and Storage.

The balance of investments across the existing portfolio of commitments (amounting to $436 billion) is shown in Figure 1. The highest level of commitment so far has been in the rail network (27%), followed by upgrading of the electricity grid (21%), water and ecosystem protection (19%) and improving energy efficiency in buildings (15%). Other low carbon technologies (including renewables, CCS and low carbon vehicles) account for the remaining 18% of stimulus commitments (Figure 1).

Figure 1: Targets for existing green recovery funds



In the UK case, out of a total of roughly £1.5 billion, two thirds of the commitment is allocated to loans for the development of low-carbon vehicles, while the rest is divided between domestic sector energy efficiency, investment in high speed rail, and a small amount for flood defence and water management.

Again, it seems clear from this analysis that there is the potential for a much more systematic allocation of financing to a variety of other green investment targets. We explore this potential further in Section 5.

In Section 5, we explore the potential for investments in six priority areas of green spending in the UK. For now, it is sufficient just to note that the emerging consensus suggests that there is a unique opportunity to invest now in the technologies and infrastructures that will be needed to address energy security, prevent climate change, and protect ecosystems.

4 Financial scope of a green stimulus

How much should be spent on a green recovery package?

In December last year, the IMF called for a fiscal stimulus level greater than 2% of world GDP.[22] The total stimulus commitment of $2.8 trillion identified in the HSBC report amounts to a little over 5% of global GDP ($55 trillion). But spread over the three years or so of the commitment programmes this implies a stimulus commitment at a level of approximately 1.5% of GDP.[23]

The Grantham Institute study argues that a case can be made for much larger levels of fiscal stimulus, perhaps as high as 4% of the GDP. This case is supported by Paul Krugman, winner of the 2008 Nobel Prize in economics, who has argued for a stimulus package for the US worth 4% of the GDP.[24] Globally, this would be equivalent to annual spending of around $2.5 trillion.

The equivalent commitment for the UK would be in the region of £60 billion – approximately three times the total size of the November PBR stimulus, and up to nine times the size of the implied annual commitment. There is a clear argument then that the UK – like many other governments – has not yet committed sufficiently to economic recovery, and has certainly not committed to the right kind of sustainable, low-carbon recovery, as argued by the Environmental Audit Committee

The **degree** to which such a stimulus should be 'green' is also in dispute. Across the world, approximately 16% of existing commitments (and less than 0.25% of global GDP) are targeted towards green investments (Table 1). But this proportion is heavily influenced by strong green commitments in China (38%), South Korea (81%) and at EU level (59%). Green elements in the US ARRA amount to 12% of its total package (having been watered down during the Bill's passage through Congress). The UK commitment is lower again at only 7% (including the car loan guarantees which many believe are far from 'green', let alone genuinely sustainable), representing only 0.1% of GDP spread over three years.

In defence of the limited size of its own 'green stimulus' to date, the UK Government has argued that the PBR should be seen in the context of an estimated £50 billion investment in the low carbon sector over the period 2008-2011, already established through the 2007 Comprehensive Spending Review (CSR07).[25] This much larger figure includes:

- £5.8 billion in private sector investment in renewables through the Renewables Obligation
- £10 billion in energy efficiency investment through programmes like the Carbon Emissions Reduction Targets, Community Energy Savings Programme, Warm Front, Decent Homes, the Landlord Energy Savings Allowance and Smart Metering
- £7.6 billion investment in the electricity transmission and distribution network; and
- £23 billion on public transport and low carbon vehicles (including Crossrail, and Transport for London).

22 See eg: www.imf.org/external/pubs/ft/survey/so/2008/INT122908A.htm.
23 Some commitments are over shorter periods of one to two years but others – including the large US commitments – are over a considerably longer timeframe.
24 *Finding a way out of the Economic Crisis*, 14th November 2008. BBC reporter Nick Robinson's newslog and interview with Paul Krugman is online at: www.bbc.co.uk/blogs/nickrobinson/2008/11/finding_a_way_out_of_the_economic_crisis.html. The ARRA package approved by Congress amounted to 5.5% of US GDP, although spreading its spending over up to a decade.
25 See Angela Eagle's written reply to Colin Challen's Parliamentary Question. Online at: www.theyworkforyou.com/wrans/?id=2009-01-21b.240318.h.

Clearly, the CSR07 commitment to low carbon investment is to be welcomed. It is a vital first step towards meeting the demanding carbon reduction targets established in the UK Climate Change Act.[26] Taken over three years, this £50 billion figure represents a commitment at the level of around 1% of the UK GDP.[27]

But it would clearly be questionable to position this existing commitment as part of an economic stimulus. In the first place, it is a commitment that predates the financial crisis and therefore sits in the baseline – rather than as an additional stimulus. Perhaps more worryingly, there must inevitably be questions about the potential to achieve the predicted £50 billion out-turn – particularly in the current economic situation – when this depends largely on the ability of government policy to stimulate private sector investment.

Perhaps the strongest argument for an expanded green stimulus is that a £50 billion commitment over three years is still insufficient to achieve the UK's demanding carbon targets. The original Stern recommendation assumed an atmospheric stabilisation target of 550 ppm. More recent IPCC evidence suggests the need for a 450 ppm stabilisation target, with more stringent reductions in carbon emissions.

Stern himself is on record as saying that to achieve a 500 ppm stabilisation target the appropriate level of investment should be at least 2% of GDP. Accountancy firm PriceWaterhouse Coopers (PwC) has suggested that meeting the 450 ppm target could require 3% of GDP to be spent on carbon mitigation.

At the higher end of these estimates, the UK should be committing something in the region of £45 billion each year to low-carbon investment alone. This would mean an additional £30 billion each year over and above the CSR commitment. In terms of a stimulus commitment at the level of £60 billion per year (4% of GDP), this suggests that at least 50% of the package should be dedicated to green spending.

This is clearly higher than the average commitment so far. It's also somewhat higher than calls for green recovery made elsewhere. The Grantham Institute has made the strongest case for a significant green component, suggesting 'that a green stimulus of the order of 20% of the total [of 4% of global GDP] would be appropriate (higher in countries with lots of unexploited opportunities for low-cost decarbonisation)'.

In our view, there are a number of arguments in support of a much more extensive greening of recovery packages. In the first place, as we've seen, this higher level of investment is required anyway to have a chance of meeting climate change targets and taking precautionary measures against imminent threats to energy security.

Equally importantly, there is a strong argument that generic recovery spending – with no green focus – will jeopardise sustainability. Investing in road building, for example, may be a decent-ish way of protecting jobs and boosting economic activity. But this will never lead to green growth. On the contrary, it is quite possible (through the phenomenon of 'infrastructure lock-in') for current investments in high-carbon infrastructures to make it all but impossible to achieve environmental

26 In pursuit of an 80% reduction in carbon emissions by 2050, the UK Climate Change Committee's 1st report has now set out a series of interim targets, the most immediate of which is to achieve a 34-42% reduction in carbon emissions over 1990 levels by 2020.

27 GDP at current prices in 2007 was just under £1.4 trillion. Over a three year period with 5% per annum nominal growth (3% real and 2% inflation) total GDP would have amounted to £4.6 trillion.

targets later. For instance, US NGOs have pointed out that President Obama's stimulus package includes $27 billion to be spent on new roads – an investment that dwarfs the much smaller sums of money set aside for low-carbon electric and hydrogen vehicles.

Likewise, bringing forward investments in school and hospital building programmes – as envisaged in the PBR – will stimulate jobs and contribute to the nation's health and productivity. But if these spending programmes are not explicitly tailored to achieve low-carbon outcomes, they represent a vast missed opportunity in carbon reduction, and could lock us into high-carbon public infra-structure for another 20 or 30 years at least. It is extraordinary that both of the Government's big capital programs (in health and education) are still not achieving the kind of low-carbon, sustainability standards that should now be absolutely mainstream in all new public sector investments.

Perhaps most strikingly of all, a fiscal stimulus dedicated towards a generic increase in highstreet spending – such as the VAT reduction in the PBR – could have entirely perverse consequences. Even if it is successful in boosting consumption – evidence suggests that households are just as likely either to save the additional income or spend it on non-domestic goods and services – there is no way of targeting this spending towards low-carbon outcomes. It would have made a great deal more sense (as the Sustainable Development Commission has been arguing for years) to have reduced VAT on all low-carbon goods and services associated with refurbishing and renovating our existing housing stock.

There will always be some call on government to spend during a recession in pursuit of broader social goals – employment in key sectors, social security for the most vulnerable and so on. On the whole, however, there are very strong arguments to suggest that green investment and green jobs should be seen not as a marginal addition to the conventional packages, but as the single biggest element in economic recovery.

As we shall see in Section 6, both social and economic returns on these investments are at least as good as those on more conventional stimulus spending. But equally importantly, green investment is absolutely essential to achieve sustainability targets.

Neither the green stimulus in PBR 08, nor indeed the much larger CSR 07 commitment, is sufficient to ensure economic recovery and build a low carbon economy. Circumstances have changed. The emerging consensus is that there is a need for a much stronger economic stimulus even than that before witnessed during the last months of 2008. And this must certainly entail increased investment over pre-crisis spending plans. Given this need, there remains a very strong case to target at least 50% of the additional spending through a 'green stimulus' element.

In short, the SDC believes that there is justification for bringing forward immediately a £30 billion green stimulus programme over and above the expected out-turn from the CSR07 commitments.

5 Priority areas

Can we justify this level of spending in the UK?

There is no point in committing up to 2% of the UK's GDP to green recovery, if there is no identifiable and appropriate target for this level of spending. Taking as a starting point the Deutsche Bank's 'green sweet spot' and the Grantham Institute qualitative analysis of green recovery targets, we identify here six key areas which taken together would justify spending consistent with a green recovery programme of up to £30 billion over and above the expected out-turn of CSR 07.

These six are by no means exhaustive, but they demonstrate in more detail how the principles described in the first part of this report might be translated into practice.

Separately from this initiative, we have also commented on Defra's own 'Green Jobs Proposal', which it has presented to Treasury. This provides an excellent summary of the wide range of opportunities available to government for short-term, job-generating investments in conservation, biodiversity, land-based industries and the local environment. A total of around £100 million would make a substantial impact in these areas, and would in the process provide a closer analogy with the original 'New Deal' initiated by President Roosevelt in the aftermath of the Great Depression in the US. The 'Civilian Conservation Corps' created at that time ended up employing millions of people involved in local conservation projects.

There are also a number of persuasive proposals from Non-Governmental Organisations (including the Soil Association and the National Trust) for government to think again about new ways of stimulating local food production systems. The potential here is enormous, and there are already signals of accelerated demand for allotments and other local food schemes. These could be significantly boosted by relatively modest, cost-effective interventions, co-ordinated through existing regional mechanisms.

In conjunction with bodies like the Environment Agency, British Waterways, the Homes and Communities Agency and the National Parks, Defra has also identified a number of substantial opportunities to help restore tow paths and waterways, clean up contaminated land, enhance flood protection and accelerate investments in sustainable waste management – including projects already in the pipeline for generating renewable energy from food waste. These are exactly the kind of strategic interventions that Treasury should be working hard to bring forward with Defra.

As that terrain is already well covered, we have focused on the six areas below. Costing these proposals **precisely** is beyond the scope of this document. However, we do offer some ballpark estimates – in at least some of these cases – for the levels of funding that might be needed to achieve policy targets. These all suggest that finding appropriate targets for this level of investment is not an issue.

Taken as a whole, our proposals would:

- Make a fundamental contribution to the development of a the low-carbon economy envisaged in recent speeches by the Prime Minister, Ed Miliband and Peter Mandelson
- Accelerate cuts in greenhouse gas emissions
- Create new jobs quickly, and in places that matter, including some of the UK's most deprived communities
- Reduce inequality, particularly by tackling the root causes of fuel poverty and poor access to transport
- Lay the foundations for UK businesses to capture a significant share of the global market in green technologies.

5.1 Accelerate the upgrading of existing housing stock

Whilst the challenge is huge, so too is the opportunity for cost-effective action. In the Stern and Bowen report mentioned earlier in this document, residential energy efficiency scores as the most effective type of programme in terms of return on investment, alongside public building energy efficiency, boiler replacement programmes, and lighting and appliance replacement.

No climate change strategy can succeed without having at its foundations a comprehensive upgrading of existing housing stock. Space heating in domestic buildings accounts for close to 20% of UK carbon emissions, and of the 25 million households in the UK, 96% of these fall some way short of the best energy performance standards. Even as the energy standards for new buildings and individual appliances improve, efficiency gains are being outstripped by the rising energy demand from ever more household equipment. Fuel poverty is on the increase again simply because not enough action has been taken to insulate our homes, which puts poor households under strain from the underlying trend of increases in fossil fuel prices. This can only get worse in the future.

The SDC has been focused on the issue of energy efficiency of the existing housing stock since 2006. Our ground-breaking report, 'Stock Take' (http://www.sd-commission.org.uk/publications.php?id=400), contained a detailed analysis of the technical potential for retrofitting. A key finding of 'Stock Take' was that whilst the technologies are already all available, a completely different approach is required to get further than the low hanging fruit of cavity walls, low-energy light bulbs and loft insulation. This needs to be driven by clear targets, financial incentives, skills training, and area-based approaches to maximise savings.

In our opinion, achieving the twin aims of eliminating fuel poverty and hitting the UK 2050 carbon reduction target means bringing the entire housing stock up to an energy efficiency standard equivalent to BRE's SAP 81 rating, which would cut current energy use in homes by 80%.

The economic, technical and logistical demands of this task are huge. Even at a rate of one million households a year, it would take 24 years to retrofit the UK housing stock to the required standard. Average costs for retrofitting households to SAP 81 are believed to be in the region of £11,000 per dwelling, although costs will of course vary depending on the type of property. Measures required range from the more obvious insulation and double glazing through to more expensive and disruptive interventions – such as cladding of solid walls, solar water heating, and fuel switching for properties off the gas grid (from oil to biomass or ground source heat pumps). There is enormous potential to drive down the costs of all of these technologies through the kind of 'economies of scale' achieved in Germany.

In addition to space heating, there will also be a need to tackle electricity demand for appliances through product standards, behaviour change, technical measures (such as smart metering and dynamic demand) and, where appropriate, the installation of microgeneration. Each type of technology has its own issues, and the potential for economies of scale to drive down costs will vary.

The policy landscape around existing homes is complex, but not yet in any way sufficient to reach the SAP 81 target proposed above.

- Current policies for funding energy efficiency and fuel poverty programmes are through obligations on the energy suppliers (the Carbon Emissions Reduction Target or CERT) and direct from Government (Warm Front, the Decent Homes programme, and the oversubscribed Low Carbon Buildings Programme).

- A new £350m Community Energy Savings Programme (CESP), due to be launched in September, still relies on a voluntary approach by coalitions of energy suppliers, Local Authorities and communities. Although very promising, this is unlikely to reach more than 90,000 homes in around 50 communities.

- The SDC has also developed proposals for the energy efficiency policy landscape post 2012 – for the Supplier Obligation which will replace CERT – which has the potential to drive the energy supply side with as much urgency as the energy demand side. This is under active consideration by DECC.

- Consultations on a Heat and Energy Saving Strategy (HES), were launched on February 12th, styled by Ed Miliband 'the great British refurb'. Ministers are seeking views on the challenge of giving 400,000 households a year 'whole house energy makeovers' by 2015, based on estimates of an average of £6,000 per household. (Achieving SAP81, including a component for skills, is likely to require in the region of £11,000.)

We believe the Government needs to go a great deal further than this. Taking training and installation costs together, the SDC estimates that there is scope for an ambitious £11 billion per year domestic retrofit programme, which would reach an average of one million households a year over and above those reached by existing and currently envisaged policy measures.

Such a programme should begin by building on the CESP proposals – systematically targeting the most deprived wards in order to tackle local concentrations of fuel poverty, and create economies of scale by focusing on particular localities. Some of the most cost effective measures, such as biomass-fuelled district heating or CHP, will require investment into infrastructure at a community level. (The SDC is itself beginning a project on Community Infrastructure Re-investment in order to assess the potential for bringing private sector capital into this equation).

The radical acceleration of action on existing homes would achieve rapid carbon savings, create jobs, drive down the costs of technologies, further improve living conditions for the most deprived communities, save households money, and reduce our dependency on imported fossil fuels. There is no more compelling case for a green stimulus.

5.2 Scaling up renewable energy supply

The UK has a clear and extremely ambitious target for renewable energy by 2020: to generate 15% of *total energy supply* from renewable sources by 2020. This implies at least 30% of all **electricity generation** from renewables by that date,[28] compared with around 4% at the moment.

Despite some signs that international firms are responding to the longer-term policy framework by showing increased interest in the UK, the recession has created a perverse effect in undermining the economics of large-scale renewables, as a result of the increased cost of and access to capital, the falling price of fossil fuels (notably oil), and the collapse in the price of CO_2 allowances on the carbon market (from €30 in mid-2008 to €8 per tonne in February 2009).

Aside from the demand side measures such as CERT and CESP referenced above (which are not specifically targeted at renewables), the main support mechanism here in the UK is the Renewables Obligation. This requires licensed suppliers to source an increasing percentage of their electricity (7.9% for 2007/8, rising to 15.4% by 2015/16) from renewable sources, or face a buy-out price. The Renewable Energy Association estimates the RO to have provided about £875million of support to the renewables industry for the 2007/2008 obligation period. Intended to bring forward the most cost-effective technologies, the RO has been criticised for failing to support renewable technologies which are further from market readiness. New proposals seek to overcome this through the revised 'banding' of ROCs –

Growth potential from wind energy

The wind industry is now established as one of the highest-growth industries in Europe – expanding at an average rate of 12% over the last 5 years. By 2007, the cumulative installed capacity was 57 GW (gigawatts), with significant job creation – 145,000 people were employed in the European Union (EU) wind energy sector at the end of 2007.

Germany, Spain and Denmark have secured the majority of the benefits from that growth and now account for more than 70% of the EU's installed capacity. Moreover, due to significant exporting from Germany and Denmark, these three countries account for more than 90% of the EU's wind-sector employees.

EU Member State	Installed wind capacity, end 2007	Wind employment, end 2007
Germany	22.3GW	80,000
Denmark	3.1GW	21,600
Spain	14.7	31,500
UK	2.2	5,000

Bain's analysis points to four factors that were common to these countries and critical to the rapid growth of their wind industries:

- Support schemes to reduce commercial uncertainty (e.g. feed-in tariff).
- Rapid building of new infrastructure (e.g. the grid) to accommodate the wind industry.
- A swift process for gaining planning consent.
- Support for wind energy in local communities – with opportunities for participation in ownership of wind farms or through tax revenues paid to local authorities for tangible benefits to the community.

The offshore market is still emerging, and the UK is strongly positioned to capture a significant share of installations due to its excellent offshore wind conditions.

Source: Employment opportunities and challenges in the context of rapid industry growth, Bain and Company, 2008.

28 *Building a low carbon economy*, page 193. Assumes the UK's burden share of the EU's 20% target is 15% of energy from renewables by 2020.

e.g. landfill gas will get one quarter ROC per MWh, wave/tidal will attract two ROCs, and so on.

Additional measures for offshore renewable energy include the Offshore Wind Capital Grants Scheme (£97m for 10 projects), and the Marine Deployment Fund (set up in 2004 with a budget of £50m, but which has had no take up). There is also a Bioenergy Capital Grant scheme for biomass heat and CHP plant, including Anaerobic Digestion (AD) for which the 2008/09 round is worth £4m. Other measures include the Bio-energy Infrastructure Scheme to support supply chains for harvesting, processing and storing biomass (worth around £6m), and the Environmental Transformation Fund which offers £10m in grants for commercial scale AD. Ministers recently announced a £500,000 fund for accelerated research into tidal reef and tidal fence technologies for the Severn estuary.
Under growing pressure to lift the UK from its humiliating position close to the bottom of the EU renewables league table, the Government has recently committed to feed-in tariffs for renewable heat, renewable power and renewable gas under the Energy Act 2008. The feed-in tariff system – which offers a simple fixed payment for every unit of renewable energy generated – has been used successfully in a number of EU member states and elsewhere.

Given the range of grant programmes and market based incentives, both current and planned, what level of additional investment might be required? A recent Ernst & Young study (commissioned by Centrica) concludes that in the next 15 years an additional £234 billion of new investment will be needed to meet UK energy goals – including security of supply, climate change targets and renewables targets. This implies an average investment of around £16 billion per annum between now and 2025. This is considerably higher than anything achieved through the Renewables Obligation and grant support schemes to date.

Analysis by the Renewable Energy Association has identified an immediate need of £625 million in spending in support of renewable energy, including: retrofitting buildings with decentralised energy; supporting bulk energy transport infrastructures; and building up crucial skills, training and awareness. At the same time, a growing number of business leaders (including Lord Browne, former Chief Executive of BP) have expressed growing concerns about the failure of government to provide the right leadership here, and have called for much more decisive measures (particularly on large scale renewables) to enable us to meet our 2020 targets.

In our opinion, Ministers should be aiming to make available a sum of at least £2 billion a year for the next three years – over and above the expected outturn from private investment through the Renewables Obligation – to ensure that we have at least a reasonable prospect of meeting our targets. The returns to the nation in terms of carbon savings, improved energy security, and meeting the UK renewable energy targets will be invaluable.

In advocating this approach, we recognise that this is not ideal. Ideally, we would move away entirely from straight government subsidy for renewables towards an electricity and heat market which values carbon and innovation properly. This was the case that we made in *Lost in Transmission*.[29] But at the moment, we are in an awkward transition phase. Grant funding is coming to an end, and capital is very hard to come by. The distant promise of feed-in tariffs and a better deal for renewables is not enough to raise capital for projects.

Ours is therefore a two-pronged approach:

- Continued reform of the regulatory structures for energy, and of grid regulation in particular, to allow renewables and distributed energy to compete
- At the same time, financial support in the form of grants or loans for renewable energy and distributed energy, seen explicitly as a transitional measure to allow the markets to develop.

29 www.sd-commission.org.uk/publications/downloads/SDC_ofgem_report%20(2).pdf

5.3 Redesigning the National Grid

Although the grid has been enhanced over the years, it was designed essentially to connect large point-source producers to largely passive users. The role of Ofgem, as the UK regulator of Gas and Electricity Markets, has been primarily to create a stable energy market and to keep prices down per unit of energy down for consumers.

In our report, *Lost in Transmission*, the SDC set out proposals for putting the need to decarbonise the electricity system at the heart of the regulatory framework. This is a critical success factor for achievement of the Government's emissions targets.

Lost in Transmission identified a series of areas for transformation. These include the creation of a regulated market for heat (most of which is currently lost), stronger incentives for the connection of renewables, putting a higher price of carbon into the cost/benefit models used by Ofgem, better enabling of local, distributed and embedded generation, and the stimulation of low-carbon innovation and investment by energy companies. The role of price control reviews in setting the levels of investment in generation, transmission and distribution are fundamental. Although we are very pleased that the Government accepted the majority of our recommendations, its refusal to amend Ofgem's primary purpose, to take proper account of today's low-carbon imperatives, remains deeply disappointing.

The Sustainable Development Commission is very supportive of the body of new proposals emerging to ensure that the National Grid is truly 'fit for purpose' in terms of the critical role it has in securing a low-carbon future for the UK. 'Grid 2.0' has the following attributes:

- It would enable distributed generation, with consumers becoming energy producers in their own right, feeding into the grid through micro-renewables, at household, workplace and community level.
- It would allow for the rapid connection of large-scale renewables such as wind, tidal and wave, particularly through strengthening the grid offshore and in Scotland, thereby allowing access from these to sources of demand in the south and east.
- It would enable intelligent management of energy demand by both consumers and suppliers, by accelerating the roll-out of smart meters and other appropriate technology. (However, the current target is to achieve this in households by 2020, which is a patently inadequate target).
- It would provide market-based incentives for both investment in low-carbon innovation, and for the inclusion within the energy mix of remote and intermittent types of renewable generation.

Market arrangements

Grid 2.0 can only be achieved by a combination of adjusting the way the market works and is regulated, and through direct public investment. Since there is a very complex set of issues surrounding gas and electricity markets, all we can do at this stage is put forward some principles for consideration. More in-depth feasibility work exists, for example, with the National Grid itself.

The primary market mechanism is Ofgem's Price Control Reviews – which would need to be used to place a much stronger requirement upon operators to invest in transforming the Grid. Since any such measures will be passed through to consumers in higher prices per unit of energy (or heat), it is vital that changes are balanced by the sort of retrofitting programme proposed in 5.1 above, so that any increases in the unit price for energy are offset by improvements in energy efficiency.

Many renewable schemes do not currently go ahead for financial or planning reasons. This means that grid connections constructed before projects are finalised may be wasted; on the other hand, waiting until finalisation may build in long delays. Our proposal is for Government to take more of this risk itself, investing in the connection of renewables through some sort of

'revolving fund', which is replenished as new energy production comes onstream. This fits with the logic of additional public expenditure at a time of recession, recouped through additional income in later years. In our Ofgem report, we called this 'connect then manage'.

Detailed work has already been undertaken on one aspect of Grid 2.0: the strengthening of the capacity of the National Grid to allow the connection of renewables.

The Transmission Access Report considered the changes that are required to facilitate the timely connection of new generation. It was conducted because network access is seen as a barrier to entry for new generators, particularly renewable generators. In June 2008, the TAR Final Report made a number of recommendations on how to improve transmission access. At the same time, Government published its Renewable Energy Strategy consultation. In both documents, Ofgem and Government asked the transmission companies to initiate work to identify the transmission reinforcements needed to support the 2020 targets. Ofgem and Government also invited the Energy Networks Strategy Group (ENSG) to provide critical industry-wide input to this work.

The total cost of the proposed reinforcements identified in the ENSG report is £4.7bn which would allow the resulting network to accommodate a further 45 GW of generation, of which 34 GW would be a combination of onshore and offshore wind generation. The development of the potential reinforcements are phased to achieve a 2020 delivery date, with the initial phase being delivered in 2015 based on the prospective growth of renewables in each region.

The ENSG study covers only one aspect of Grid 2.0. We have not been able to identify cost estimates for the other key components of Grid 2.0 – such as local distribution systems which allow for the active management of levels of two-way energy flows which would enable micro-generation at scale and over large areas. In the US, where Grid 2.0 is a key part of the current fiscal stimulus package, the cost per household in the U.S. has been estimated at the equivalent of £6,000. US estimates are for 10% savings both in the cost of energy and in carbon emissions from electricity supply, due to the increased efficiency of the redesigned grid. Greater savings in emissions should of course gradually result from increased take-up by renewable energy providers. These figures imply annual savings of around $40 billion, with a payback period of 25 years. Any conversion from U.S. to UK costs per household is problematic – for example, such a calculation would need to take into account the higher density of housing and the greater age of the housing network here in the UK. But to give a very rough indication, if the UK spent five times less than U.S. per household, the total cost would still be around £30 bn. Higher household density in the UK, reducing the total cost of the project, also has the effect of greatly reducing the payback period, probably to around 10 years.

To help make this happen, without further delays of the kind that will make it totally impossible to achieve our 2020 targets, we believe the Government should be prepared to commit up to £5 billion a year on grid improvements of one kind or another, over and above the £7.6 billion expected to be delivered through CSR 07.

5.4 Promoting sustainable mobility

Transport emissions account for over a quarter of UK carbon, and are rising faster than any other sector. The sector is heavily reliant on imported fuels with a significant cost to the UK trade deficit. Of the 5.3 million tonnes of petroleum products used for energy in the UK, 78% are consumed by the transport sector (BERR 2008). BERR projections for UK oil and gas production and demand indicate that by 2013 we could be importing 80 million tonnes of oil equivalent. At $100 a barrel, this would cost the economy $57 billion.

In addition, people's heavy reliance on the car, even for short journeys is contributing to:

- **congestion** – which the Eddington Review estimated will cost £22 billion by 2025 if left unchecked
- **road accidents** – with about 3000 killed and 28,000 seriously injured every year on UK roads
- **increasing levels of obesity** – By 2050, Foresight modelling indicates that 60% of adult men, 50% of adult women and about 25% of all children under 16 could be obese[30]
- and **lower levels of environmental quality** across the UK.

Urgent action is needed on all these counts, in particular:

1) to massively increase levels of walking and cycling for shorter journeys
2) to encourage behaviour change to more efficient use of motorised transport (car sharing and public transport)
3) to ramp up investments to improve the capacity and efficiency of the rail network
4) to introduce decisive, hard-hitting measures to create a shift to lower carbon vehicles.

Smarter Choices

The 'Smarter Choices' approach involves a range of strategies that are designed to provide communities with the information they need to make more sustainable travel choices. The DfT is already committed to engaging with local authorities, yet a significant number (20%) do not even consider Smarter Choices in their Local Transport Planning.

Through its Sustainable Travel Towns project, the DfT has been working with Darlington, Peterborough and Worcester to introduce a range of sustainable travel measures on a town-wide basis. All three towns have run travel marketing and personalised journey planning pilots. Ten Smarter Choices measures have been identified in the Department for Transport publication, *Making Smarter Choices Work*:

- Workplace travel plans;
- School travel plans;
- Personalised travel planning
- Public transport information and marketing
- Travel awareness campaigns
- Car clubs
- Car sharing schemes
- Teleworking
- Teleconferencing
- Home shopping.

As a critical element in its 'green recovery' plans, the Government should now commit to a national roll-out programme for 'Smarter Choices'. This would help people to both avoid the need to travel, and to find cheaper, more efficient, and lower-carbon ways of making essential journeys in the face of the credit and climate crunches. 'Smarter Choices' need to be 'locked-in' through further measures; including financial measures for instance, (reduced bus fares), redesigning road space (bus priority lanes, widening pavements and re-designing junctions), and regulatory measures (re-allocating car parking space for bicycle and car clubs). The costs of reconfiguring infrastructure in

30 www.foresight.gov.uk/Obesity/20.pdf

this way depend on the scale of the measures, particularly new walking and cycling routes and expenditure on bus services.

In comparison to many European countries, the UK has lagged far behind in the creation of high quality and attractive routes for cycling and walking. Since 1950, there has been a fivefold reduction in cycling, and fear of the danger imposed by motorised traffic is cited as the primary reason people don't cycle as much as they'd otherwise like to. Investment levels in cycling in the UK have historically been in the region of £1 per person per year, whereas areas of the Netherlands, even after 30-40 years of development, are still investing at between €3 and €27 per person per year. As a result, of journeys under 5 miles in the Netherlands, 34% are made by bicycle and 27% are walked. A recent report for Cycling England estimated a benefit of just over £300 per additional cyclist per year,[31] and this is **excluding** the potential savings due to reduced obesity, mental health benefits, and social benefits.

At the higher end of the range of spending in the Netherlands – which is exactly where the UK needs to be to catch up – the investment spending in walkability and cyclability needs to be in the region of £1 billion each year. Overall, however, such policies are considerably cheaper and more cost-effective than new road-building. Based on data from the three existing 'Smarter Choices' schemes, the scaled-up cost of a national programme would be in the region of £400 million a year. DfT's own evaluation of these schemes shows (when congestion and carbon reductions are fully monetised), a cost/benefit ratio of 1:10, implying savings of £4 billion a year. Using DfT's own figures, the NGO Sustrans estimates savings from such a scheme of nearly a million tonnes of CO_2 a year.

The report, *A Low Carbon Transport Policy for the UK*, written by Keith Buchan of the Metropolitan Transport Research Unit, includes a wide-ranging policy package to tackle CO_2 emissions from transport and reduce them by 26% by 2020. http://www.bettertransport.org.uk/media/press_releases/november_2008/cutting_emissions. Amongst six areas of policy, it includes proposals to reduce journey lengths and transfer short car journeys to walking and cycling. It suggests a substantial 'Smarter Choices' fund to help change travel behaviour, including specific initiatives on school travel (walking, cycling, school safety zones and school buses), shopping (home delivery, local collection and local sourcing) and leisure (entrance/public transport tickets for sporting/music events, support for local parks), as well as more 'car clubs' and better information and marketing of travel choices.

Taking all this into account, we believe the Department for Transport should commit to an integrated programme of Sustainable Mobility measures of at least £1.5 billion a year for the next three years. We see no reason why the lion's share of this should not come via redirection of current commitments on road building.

31 *Valuing the Benefits of Cycling – A report to Cycling England*, May 2007 www.sustrans.org.uk/webfiles/AT/Useful%20reading/Valuing%20the%20benefits%20of%20cycling%20.pdf

Government fleet/new car procurement

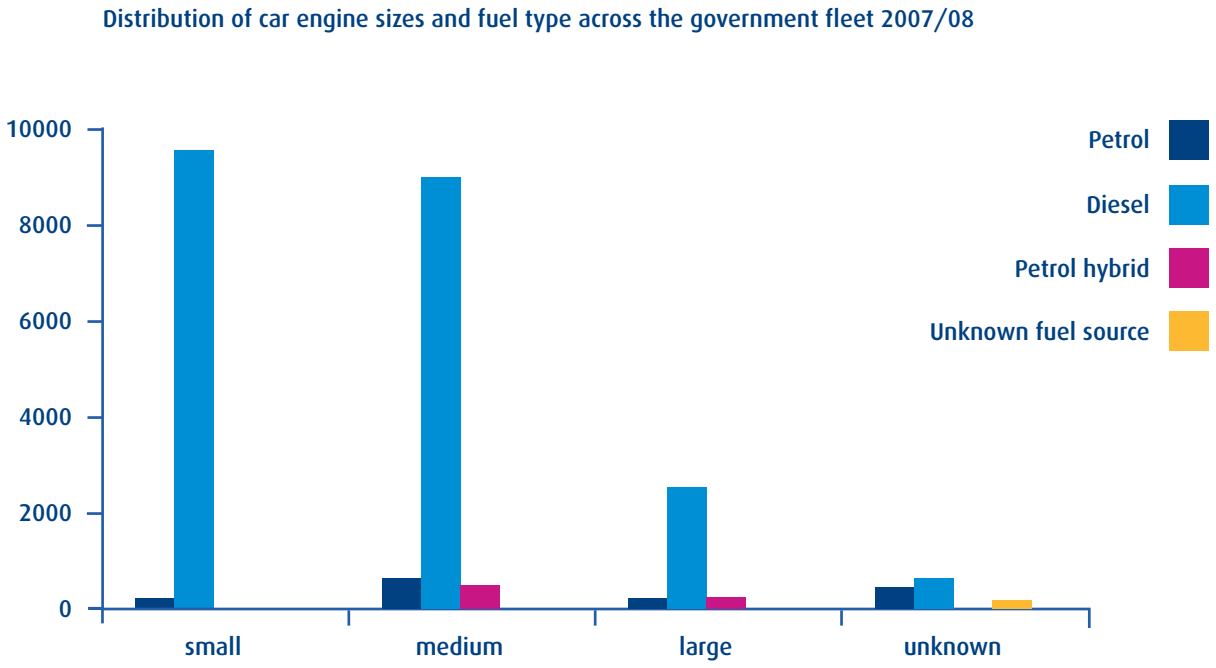
Over and above investments of this kind in 'Smarter Choices', the Government must set an example in the way it procures new vehicles. The Government's fleet consists mainly of small/medium diesel vehicles (see figure below). Despite a target for new vehicle procurement of 130gCO_2/km, there is a lack of clear commitment to procure ultra-low carbon vehicles, as well as a lack of guidance to induce behaviour change to ensure the most sustainable travel options are taken.

The Low Carbon Vehicle Procurement Programme (LCVPP) represents a commitment by government to be a leader in the procurement of lower carbon vehicles. The SDC has welcomed this. However, as the programme focuses on vans in the first phase (£20m), the government must broaden the commitment to include **all** sizes and types of ultra-low carbon vehicles, including electric vehicles (EVs) powered by renewable energy sources.

The SDC recommends an announcement of a significantly larger fund in the future to replace government fleet vehicles (after proper consideration of all relevant life cycle factors), with ultra-low carbon vehicles which would help government meet its carbon reduction commitments, as well as stimulate innovation in the industry. To achieve real results in this area, the Government should consider an investment of £500m, in addition to the £30m already earmarked for a subsequent phase of LCVPP.[32]

We believe this would represent far better value for money for tax payers than the current 'scrappage schemes' under consideration, which would serve, in effect, to create a market that simply isn't there at the moment. This would stimulate unprecedented innovation amongst vehicle manufacturers to compete in that market place.

Figure 2: Existing Government car fleet by engine type and size



32 SDiG 08 data collected from departments indicates a government fleet size of 23,556 vehicles. As a proxy for ultra-low carbon vehicles, we have used the 2009 Ford Fiesta ECOnetic, which the government's Act on CO_2 website lists as the most fuel efficient new car (www.direct.gov.uk/actonCO$_2$) at 98 gCO_2/km. If 100% replacement is assumed, and using the current price of the Fiesta ECOnetic of £12K as a per unit estimate, the cost of such a programme would be £283m.

Rail

As regards rail transport, fares are already 50% higher in the UK than they are in Europe. And yet the Government is planning to reduce its investment in the railways by £2 billion a year, whilst expecting passengers to contribute an additional £9 billion a year. This makes no sense at all, in that it will further preference car use over rail at a time when we need to be doing exactly the opposite.

Though it is beyond the scope of this report to present a detailed analysis, the Sustainable Development Commission believes that the Government must now unequivocally demonstrate its commitment to the future of rail. Whilst we strongly support its recent interest in High Speed Rail and in the further electrification of the existing network, we would like to see this brought forward more urgently and at a much higher ambition level. With subsidies maintained at the current level, this indicates the need for a commitment of around £5 billion a year. This is over and above the £23 billion out-turn expected from the CSR 07, which is dominated by the funding for Crossrail.

5.5 Low carbon investments in the public sector

The SDC has an on-going programme of work to encourage Government to lead by example with respect to its own sustainable operations and procurement. Every year, we produce a report on performance by Whitehall departments against its own targets. On CO_2, for instance, government offices were responsible for 2,642,623 tonnes of CO_2 in 2007/08[33]. There is a commitment to cut these emissions by 30% by 2020 (compared with 1999–2000 levels). SDiG 08 reports a reduction of 6.3% in carbon emissions from offices since the baseline year; an improvement of 2.3% from 2006/7. This is clearly woefully inadequate given the additional target the Government has for achieving carbon neutrality on the central government estate by 2012.

Media interest in the poor energy performance of government buildings is very high. An unpublished auditing study will show that some 8,849 public sector buildings emit **5.6m tonnes** of CO_2 per year, with one in six buildings receiving the lowest possible energy efficiency rating.[34] Pan-government figures continue to show poor performance against the BREEAM buildings standards commitment, with only 42% of total projects (new build and major refurbishments) achieving the required standard.[35]

This sends out all the wrong signals both to the private sector and to individuals. From next year, all Government departments, along with the wider public sector (school, hospitals, prisons and local authorities) will be required to participate in the Carbon Reduction Commitment (CRC). This scheme will also encompass large swathes of the private sector. Poor understanding of its implications for the public sector is compounded by the fact that the baseline for the CRC will already have taken into account the improvements in carbon emissions made in recent years, and will therefore prove a much more challenging starting point. Poor performance by public sector organisations will result in the leakage of taxpayers' money to the private sector.

Many of the measures required to address this chronic under-performance have short payback times, which makes this whole area of Government performance a prime target for 'invest to save interventions'. The Commission is working closely with DECC, and with the Centre of Expertise for Sustainable Procurement (CESP), on how this 'Big Energy Shift' across Government and the Public Sector can be dramatically accelerated. Increased levels of funding are a necessary but not sufficient condition. It is notable, for instance, that the principal financing mechanism in this area – the SALIX fund – remains undersubscribed, as is the public sector element of the Low Carbon Buildings Programme.

The reality is that hard pressed School Heads or NHS Trust Chief Executives are required to give priority to the delivery of the front-line services for which they are accountable, and there is growing evidence that many would actively welcome a more prescriptive 'command and control' approach, which would give them the benefits of lower fuel costs and lower-carbon buildings through directed help and support. Otherwise, the kind of targets outlined in the NHS's excellent new 'Carbon Reduction Strategy for England' will remain exactly that – just another batch of non-mandated aspirations, which means that vast sums of taxpayers' money will continue to be wasted simply as a consequence of not getting on top of the NHS's enormous energy bills.

Dramatically improved energy efficiency initiatives must be the top priority for government. However, a programme of support (advice and finance) for self-generated renewable energy is also needed. This should include regional/collaborative schemes to allow departments to work together and share costs as well as opportunities. The SDC is undertaking research to identify which self-generation technologies would work best on the government estate.

33 Sustainable Development Commission, *Sustainable Development in Government* (SDiG) 2008 Assessment, December 2008
34 The Guardian, 23 December 08, accessed at www.guardian.co.uk/environment/2008/dec/23/carbon-emissions-uk
35 Sustainable Development Commission, *Sustainable Development in Government* (SDiG) 2008 Assessment, December 2008

Early findings highlight wind energy, photovoltaic and biomass as the most appropriate technologies. The study will identify in rough terms the size of the investment required, the potential energy production, and the associated carbon savings.

Initial findings suggest a level of investment of at least £3bn a year. We see no reason why these investments (in both efficiency and self-generation) should not be made via an extension of the existing SALIX fund.

Crucially, this proposal offers the means of achieving the existing target of carbon neutrality in energy use on the central government estate by 2012. Hitting this target is important not just for its own sake, but because there is a substantial reputational risk to Government in missing it. There is also a substantial financial penalty for failure: if carbon reductions are not made on the central government estate, the Carbon Reduction Commitment will require offsets to be bought from elsewhere at an estimated cost (at their current very low price) of £40 million per year.

5.6 Employment and skills

This proposal supports the other five priority areas, but is no less important. There is plenty of evidence to suggest that even if the demand-side strategies outlined above, were put in place, much more effort will also be required on the supply side. Defra's Green Jobs Strategy, for instance, outlines in stark terms the skills shortages, manifest in unfilled vacancies in key sectors such as the construction industry.

It is critical that as many as possible of the substantive proposals in this document translate into jobs in short order – otherwise they will not work as a stimulus package and may not be deliverable anyway. Although this will be partly a matter of taking up existing slack, it will almost certainly require reskilling and upskilling. This means the skills sector will have to design the courses and qualifications needed and start to provide the training on the scale needed within a very tight timetable. The SDC is already in dialogue with DIUS, whose responsibility it is, working through a range of delivery partners, to help make this happen.

For each of our proposals this means:

- working with the relevant government departments and private companies to identify the skills and resources needed
- working with the Sector Skills Councils and other skills and qualification specifiers (including leading-edge employers, trade and professional bodies etc) on the range of the skills required
- on the basis of the above, ensuring that training providers (whether FE colleges, private sector training companies, or employers themselves) are able to supply the training needed, and, where appropriate, redeploying government finance to enable them to respond quickly
- ensuring that companies are aware of the opportunities this kind of 'Sustainable New Deal' could create for them, so that they create demand for skilled employees (whether this means training the existing workforce or employing new employees). In part, this means making use both of DIUS's 'Train for Gain' brokers (advisors to business on the subsidised training they could receive) and of BERR's 'Business Link' advisers
- providing additional financial support to the extent that there is demand for skilled labour but shortage of funds means this does not translate into demand for courses.

This requires a whole series of enabling interventions by government rather than central planning. DIUS cannot and should not be issuing edicts about how many courses in what are conducted where – but it should be ensuring that information flows quickly to the right people, and that central government funding flows appropriately. At the very least, the Government should be significantly ramping up its investment in business support to help SMEs meet new expectations around resource efficiency and low-carbon.

More quantitative work has been done on specific sectors. For example, the TUC estimates that jobs in the energy sector as a whole will need to grow from 16,000 to 133,000 to manufacture, construct and operate the new technologies.[36] In the period to 2020, on- and offshore wind farms are likely to generate over 80% of the 38.5 GW of installed renewable electricity capacity, and up to 36,000 direct new UK jobs could be created in the wind energy sector.[37]

For retrofitting housing stock, the current levels of investment in skills seems to be insufficient to meet even the existing level of demand, let alone

36 *Supply Chain Constraints on the Deployment of Renewable Electricity Technologies* Douglas Westwood, 2008.
37 *Employment opportunities and challenges in the context of rapid industry growth*, Bain and Company, 2008.

that which would be required for the accelerated programme we propose.[38] Investment in retrofitting skills is estimated (within the £11,000/property) at an average of £500 per dwelling. Without this, costs will be higher, because the skills gap is already pushing up the price of domestic retrofitting. Much of the coordination on skills training occurs at local level. For example, the London Energy Partnership found that six Sector Skills Councils have responsibility for skills and training in energy efficiency and renewable energy.[39] Co-ordination and decision-making on skills provision is needed both at national and local levels.

Summary

What's clear from this illustrative exercise is that there is more than sufficient scope for a green stimulus investment in the order of £30 billion per year. In addition to these priority areas, it is also worth remarking here that there are enormous additional opportunities in addressing energy efficiency in the non-domestic building stock, improving process efficiency – in particular through small-scale co-generation technologies – in industry, implementing distributed heat and power networks, and investing in ecosystem protection and maintenance.

In summary, the SDC is proposing a Sustainable New Deal for the UK which sets in place annual investments of around £30 billion per year. Taken together with the anticipated outturn of £50 billion from CSR07, this would put the UK on track to achieve its climate change commitments, reduce the cost of energy to the national purse, improve health (for example through lower fuel poverty and less obesity) and deliver improved environmental quality for generations to come.

In the final section of this report, we explore some of these social returns in more detail.

38 ProEnviro, *Skills for a Low Carbon and Resource Efficient Economy*, 2008
39 LDA/London Energy Partnership, Skills for a low-carbon London: summary report and recommendations, March 2007

6 Social returns to a green stimulus package

What are the likely returns in terms of jobs and other benefits?

The social returns to a green stimulus package of the kind outlined in the previous section are to be found in a number of areas:

- Reduced reliance on scarce and imported energy resources
- Reduced carbon emissions
- Economic savings from lower fuel bills, reduced congestion, fewer road traffic accidents and reduced pollution
- Improved quality of life through healthier lifestyles, lower levels of obesity and better neighbourhoods
- Protection and creation of a significant number of jobs.

We have already indicated the extent of some of these returns in the previous sections. Estimates from the US suggest that green energy initiatives have the potential to save the US economy almost half a billion dollars each year for every $1 billion invested, as well as saving over half a million tonnes of greenhouse gases and providing 30,000 jobs. It's been estimated that a large-scale programme to expand energy conservation and renewable energy in the EU could create up to two million new full-time jobs. The South Korean Green New Deal estimates that it will create almost one million new jobs.[40]

Numerous other recent reports (including those associated with national recovery plans) have pointed to the employment potential from a green stimulus. As Deutsche Bank has argued, 'one of the reasons that the "green sweet spot" is an attractive focus for an economic stimulus is the labor-intensity of many of its sectors.'[41]

A report by University of Massachusetts' Political Economy Research Institute (PERI) supports that view. It identifies six priority areas for investment: retrofitting buildings, mass transit/freight rail, smart grid, wind power, solar power and next generation biofuels. The authors calculate that spending $100 billion on these interventions over a two year period would create two million new jobs. By contrast, the same money directed at household spending would generate only 1.7 million jobs. And if directed at the oil industry, fewer than 600,000 jobs.[42]

As the HSBC analysis makes clear, there are still considerable question marks over the precise potential for job creation from a green stimulus – as there are for job creation from any recovery package. Estimates differ from country to country, from sector to sector, and from context to context. Ideally, we would need a robust, sectorally-disaggregated model of employment to assess the precise impacts in the UK. Treasury has been talking for years about potential jobs from investments in 'a green industrial revolution', but has as yet failed to do any comprehensive analysis of what this means in practice.

In the absence of such an exercise, Table 2 convenes a number of the estimates for job creation (or protection) from studies and spending plans around the world. It shows the nature of the spend, the estimated job creation potential, the overall scale of investment and the investment cost per job. The final column shows the (pro rata) employment benefit from a fiscal package worth £30 billion.

40 See for example: *A green global recovery? Assessing US economic stimulus and the prospects for international coordination.* Policy briefing PB09-3. Peterson Institute for International Economics/WRI, February 2009; *Green Jobs: towards decent work in a sustainable, low carbon world.*

41 DB 2009, p4.

42 PERI 2008, p10.

Table 2: Estimated job impacts of stimulus spending

Programme	Jobs created or saved	Investment billion £	Investment cost per job £k/job	Job creation potential from £30b
Renewables and energy efficiency (PERI/CAP study)	2,000,000	69.0	34	870,000
Renewables, grid, energy efficiency, public transport (ARRA)	2,500,000	77.4	31	968,000
Energy efficiency (Apollo Institute, US)	21,500	1.0	32	935,000
Renewables, energy efficiency, public transport, water and waste (South Korea)	950,000	21.4	23	1,333,000
Renewables, energy efficiency, public transport, ecosystems (UNEP)	30,000	0.7	23	1,305,000
Infrastructure fund to build low carbon homes (EIC)	160,000	6.0	38	800,000
Retrofit energy efficiency in low income homes (EIC)	145,000	1.5	10	2,900,000
Retrofit energy efficiency in schools and hospitals (EIC)	21,500	1.0	47	645,000

Although there are some outliers, there is a reasonable consensus from these estimates that a stimulus package of up to £30 billion a year could create at least 800,000 new jobs.

It's important to note in addition that there are clear, additional economic returns from a green stimulus. Some – but not all – of these returns accrue directly to government, and can therefore properly be accounted for in a fiscal account of any stimulus package. Such returns include direct fuel cost savings to government, as well as indirect savings in public expenditure resulting from reduced health costs, less congestion and lower levels of pollution. Internalising some of these costs – for instance through a carbon price – will inevitably increase the visibility of these direct returns to the government purse.

Some of the returns accrue to businesses and households rather than directly to government. In conditions of recession, this is clearly in the national interest in so far as it boosts household income and reduces the pressure on firms to axe jobs. But it also raises the question of how such spending is to be paid for.

Four broad options present themselves: deficit spending; raising money through environmental taxation or the auctioning of carbon permits; issuing green bonds; or increasing the public ownership of energy-related assets.

1 In the very short-term, the most obvious option is conventional deficit spending – increasing the Public Sector Borrowing Requirement. But it is far from ideal. Increased deficit spending at this point is likely to push the public sector net debt to levels approaching 70% of the GDP within a year or so, from which the UK could take decades to recover.[43] Besides this, there are clear signs of 'saturation' in conventional debt markets, with a real prospect of failure in the government's ability to raise increasing levels of debt.[44]

For this reason, there is now a strong case for serious consideration of the other options. If households are – as would be expected – benefitting from reduced energy-related costs as a result of green recovery investments, then what is required is an appropriate mechanism for balancing investment costs against these economic returns. Each of the three additional options identified above achieves this aim.

2 Environmental taxation is perhaps the 'bluntest' instrument for recovering investment costs, but one in which there are strong grounds for serious consideration. There is clearly an urgent need to open up a public debate about the long-term sustainability of the UK tax base in the context of rising public sector debt. The role that a shift towards environmental taxes might play in this should be a part of that discussion. In fact, the UK Government has a long-standing commitment to the principle of environmental taxation which it has completely failed to capitalise on so far, and irrespective of its use as a funding mechanism here, there is a strong case to improve the Government's record in this regard.

3 A further option would be to fund specific elements of a sustainable new deal through 'green bonds' – bond issues which are targeted directly at low-carbon investments of the kind identified in Section 5. This idea has a strong rationale under current conditions for a variety of reasons. In the first place, it is clear that many of these investments offer considerable returns, at a point in time when the returns on conventional savings (particularly household savings) are disappearing.

The absence of suitable savings vehicles is particularly frustrating when the propensity of UK households to save is finally emerging from the doldrums. The savings ratio in the UK collapsed dramatically over the last decade and fell below zero in the first half of 2008 to reach a 40 year low. But it is now recovering – as it tends to do in times of economic slowdown. Keynes's 'paradox of thrift' is frustrating for government policies aimed at encouraging people to spend. But instead of going against the grain of people's natural financial prudence at such times, there is a good case for providing robust and credible vehicles to save in a form which could provide the basis for stimulus funding. Green bonds offer people a clearly differentiated way of bringing consumer choice to bear on investment markets at time when bond markets are saturating.

This opportunity is important for another reason. The evidence from consumer research suggests that people are desperate for guidance on ways not just to change their lifestyles to be 'greener', but also to shift their investment decisions.[45] By targeting such bonds at domestic savers, green bonds could also reduce the UK's high exposure to 'external' debt.[46] In summary, green bonds provide a differentiated savings product when the propensity to save is high; and in doing so they inject investment funds directly into green recovery.

4 Finally, innovative service structures, which share the rewards from low carbon investment between households and investors, have a clear rationale here. This 'energy services model' is usually assumed to proceed through private sector energy service companies, and there is no reason to preclude that possibility here. But there are some strong arguments to suggest that government itself could take some stake in the ownership of energy-related assets – particularly when public funds are flowing through them to stimulate investment. The argument here is not dissimilar to the one used to justify public ownership in the banks. There is a legitimate public claim on the return from public investment wherever those funds are directed. The energy sector case for equity funding from the public sector is at least as strong as the financial sector case where the model is now widely accepted.

One thing is clear: achieving long-term social goals in the energy sector already requires innovative thinking and creative approaches to asset ownership and investment architecture. The case for a green recovery package simply pulls these issues to the fore. Before consigning the nation to additional years of national debt, it is clearly crucial to explore the full range of funding options in much greater depth.

43 For more discussion on this issue see *Prosperity without Growth? The Transition to a Sustainable Economy*. (Sustainable Development Commission, 2009).

44 On 25th March 2009, a 'gilt' auction failed in the UK for only the 4th time since 1986. Though not in itself an indication of a collapse, this failure was a worrying indication of increasing difficulty (and cost) in funding UK public debt.

45 *I will if you will – Report of the UK Sustainable Consumption Roundtable* (Sustainable Development Commission/National Consumer Council, 2006)

46 The external debt refers to debts held overseas. The UK's external debt is the second highest in absolute terms after only the USA and is equivalent to around four and a half times the UK GDP (SDC 2009, Chapter 2).

7 The road to a sustainable economy

The arguments set out in this document suggest that there is a very strong case for expanding the green stimulus set out in the November PBR as part of a wider package of measures to rescue the UK economy from the current recession, whilst at the same time furthering sustainable development.

Consideration of the different timescales involved here is essential for any evaluation of these proposals. The sustainable development agenda is necessarily long-term, and some of the programmes SDC has suggested would require consistent funding over a long period, particularly in the case of a comprehensive retrofit of the existing housing stock. Assuming an economic recovery in 2010, any such long-term programmes would need to be continued after the end of the period during which a fiscal stimulus is required.

In fact, from a sustainable development perspective, the notion of 'economic recovery' is itself a problematic one, because recent patterns of virtually worldwide economic growth, if resumed in a year or two, will have a devastating impact on eco-systems, and on the capacity of the planet to provide the foodstuffs, metals, and other natural and environmental resources on which the world economy depends.

The relentless pursuit of this kind of business-as-usual economic growth would bring us, in the medium to long term, back into recession, principally through the mechanisms of increased commodity prices and climate-induced shocks. Short-term proposals for a Budget for sustainability, as set out in this document, and others like it from other organisations, should therefore be seen in this longer-term context. This context has been addressed head-on in the SDC report *Prosperity without Growth?*.

In spite of this, as we have demonstrated, there are very strong arguments in support of an immediate green stimulus package which could comprise at least 50% of an economic recovery package representing some 4% of GDP. A green stimulus offers jobs and economic recovery in the short term, energy security and technological innovation in the medium term, and a sustainable future for our children in the long term.

Published by the **Sustainable Development Commission** © April 2009

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