Unlocking investment to deliver Britain’s low carbon future

Report by the Green Investment Bank Commission
Unlocking investment to deliver Britain’s low carbon future

Report by the Green Investment Bank Commission
Unlocking investment to deliver Britain's low carbon future
Climate change is clearly the major challenge for our times. I was therefore delighted to be invited by the Chancellor of the Exchequer and the Minister of State for Climate Change late in 2009 to set up and chair the Green Investment Bank Commission. There can surely be no more rewarding way to reinvest 25 years’ experience in investment banking and business than working out how to ensure the UK can finance its climate change obligations over the next four decades.

I am very fortunate to have been supported by both a world class commission of business leaders and policy experts and also by an energetic and deeply knowledgeable advisory panel. Our wide consultation resulted in many helpful contributions, for which we are very grateful. It also revealed a wealth of expertise in this nascent policy area waiting to be better harnessed and co-ordinated.

I believe our report has produced some radical and substantive policy recommendations and financing ideas. I was very encouraged when the Prime Minister reiterated his commitment to a low carbon economy in his speech the day after the recent General Election and was further encouraged by the terms of the Coalition Agreement, containing as it did specific references to a Green Investment Bank (GIB) and low carbon economy. The Queen’s Speech also referred to the intention to establish a GIB. I hope this report and the thinking that has gone into it will provide a blueprint for the rapid establishment of a Green Investment Bank which will comprehensively address the market failures and barriers to investment we have identified.

We have sought to answer all the key questions a new Government could sensibly ask about what the Green Investment Bank should and should not do, how it should be governed and how it could be set up. I very much hope the Government will seek to implement our principal recommendations following further appropriate analysis and I will do whatever I can to support the implementation of what I now believe to be a crucial initiative.

Bob Wigley
June 2010
Contents

Foreword by the Commission Chairman  iii
Green Investment Bank Commission  vi
Other Contributions  vii
Glossary of Terms  viii
Executive Summary  xiii

1  The size and nature of the green investment challenge  1
2  Market failures and barriers to investment  5
3  The case for intervention  9
4  The role of the Green Investment Bank  13
5  How the Green Investment Bank would raise and invest money  17
6  Deployment and products  25
7  Governance and reporting  37
8  Operational set up and implementation plan  41

Annexes  43
Since February 2010, the Green Investment Bank Commission, an independent and non-partisan advisory group brought together by the Chancellor of the Exchequer, has been working to identify how Britain can better support and accelerate the private sector investment required to deliver the UK’s transition to a low carbon economy.

The Commission has consulted widely with experts in government, business, policy and finance to identify the barriers that are constraining investment. In response, we have developed proposals for a Green Investment Bank (GIB) that could help to remove these barriers and rapidly increase investment in the low carbon infrastructure and technologies that Britain urgently needs.

The members of the Green Investment Bank Commission are:

- Bob Wigley (Chair), Chairman, Yell Group plc
- James Cameron, Vice Chairman, Climate Change Capital
- Mark Ferguson, Chief Investment Officer, Generation Investment Management LLP
- Katherine Garrett-Cox, Chief Executive, Alliance Trust plc
- Seamus Keating, Chief Financial Officer, Logica plc
- Nick Mabey, Chief Executive, E3G

The members of the advisory panel are:

- Ben Caldecott, Climate Change Capital
- Sean Hanafin, Citibank
- Ingrid Holmes, E3G
- Abyd Karmali, Bank of America Merrill Lynch
- Miriam Maes, Foresee Ltd
- Shaun Mercer, Carlyle Group
- Tom Murley, Hg Capital
- Davide Taliente, Oliver Wyman
- James Wardlaw, Goldman Sachs
- Arran Yentob, Oliver Wyman

The Commission’s recommendations are independent and based solely on the views of its members.
Other Contributions

The commission consulted widely and publicly, inviting contributions through a website, and received significant and helpful contributions to its work from many individuals and organisations including:

Alex Veys
Bircham Dyson Bell LLP
Bloomberg New Energy Finance
Carbon Trust
Climate Change Capital
Co-operative Bank
Deutsche Bank
Dieter Helm
E3G
Energy Saving Trust
Energy Technologies Institute
Foresee Ltd
Generation Investment Management LLP
Green Alliance
Greenpeace UK
Jupiter Asset Management
Kenneth Berlin, US Green Bank Coalition
Kirsty Hamilton, Chatham House
Legal & General
Lord Stern of Brentford
Matrix
National Grid
Oliver Wyman
Price Waterhouse Coopers
Royal Bank of Scotland
RWE npower
Sir Robert Margetts
WHEB Ventures
WWF UK
Zac Goldsmith
Amortisation – paying off an interest bearing liability by gradual reduction through a series of instalments comprising both principal and interest components, as opposed to paying it off by a simple lump-sum payment.

Asset backed or securitised bonds – similar to ordinary bonds but have specific assets whose revenues pay the interest and principal. An ordinary bond’s payments are generally guaranteed by the company that issues them. In asset backed or securitised bonds a set of revenue generating assets are put into a special purpose company and these assets pay the bond holder their interest and principal.

Bonds – can variously be described as IOUs, loans or debts. They are similar to bank loans, but generally last longer (from one year to over 30 years). When institutions, companies, governments and other entities want to raise long term finance but do not want to dilute their shareholdings (or, indeed, cannot issue share capital), they turn to the bond markets. The biggest investors in the UK are the insurance companies and pension funds. They buy bonds to generate return, offset their liabilities, generate income or diversify their portfolios.

Carbon markets – a market that handles trade in carbon emission reduction credits and other carbon-related derivatives, thereby creating a price and ultimately an economic incentive for reducing carbon emissions.

Clean Development Mechanism (CDM) – an arrangement under the Kyoto Protocol that allows certain developed (Annex I) countries to meet some of their emission reduction targets by investing in cheaper projects in developing countries as opposed to more expensive ones at home.

Club Deals – instead of syndication, banks are clubbing together on equal terms to provide the debt facility through a club deal. This is where each bank commits to the level of funding they can provide to a particular deal and enough banks pool together to meet the total cost of the project to acquire or build. Each bank is involved in the negotiations of the terms and pricing.

CO₂ equivalent (CO₂e) – a measure of the warming effect (“radiative forcing”) of mixtures of greenhouse gases, expressed as a standard concentration of CO₂. Thus in 1998 CO₂ concentration was 365 ppm of dry air, but the effects of methane, nitrous oxide and other GHGs in the air at that time were in warming terms equivalent to another 47 ppm of CO₂; the result is a CO₂e of 412 ppm. Throughout this report, CO₂ means CO₂e unless otherwise stated.

Construction risk – this will cover the risks involved with the build, the interfacing of different contracts, the degree of protection from liquidated damages for project delays, other damages and build timing.

Conventional bond – one that has a fixed maturity date and a fixed coupon. It has few, if any, bells and whistles (like complex formulae for interest payment linked to equity prices, or maturity dates that can be changed). Simply put, it is a bond that will pay a set interest rate over a predetermined time and return the original or par value of the investment at this maturity date. These very plain bonds are often called “vanilla” bonds.

Corporate Finance – debt provided by banks to companies that have a proven track record, using “on-balance sheet” assets as collateral. Most mature companies have access to corporate finance, but have limited total debt loads and therefore must rationalise each additional loan with other capital needs.

Corporate Lending – banks provide finance to companies to support everyday operations. An assessment is made of the company’s financial strength and stability, and debt is priced accordingly. These bank facilities place few restrictions on how the company can use the funds, provided certain general conditions are met.

Cost of Capital – the weighted average of a firm’s costs of debt and equity, in turn linked to risk involved in the underlying project or company. From an investment perspective, to be worthwhile, the expected return that an investor receives for putting money at risk must be greater than the cost of capital.

Cost of Debt – LIBOR is the London Interbank Offered Rate, based on the interest rates at which banks borrow from each other in the UK; the EURIBOR is the interest rate used for Euro-
pean transactions; in the US this is roughly equivalent to the US Federal Funds Rate, and reflects the cost of debt, without any risk. When making a loan, a bank will add a margin to LIBOR to adjust for the risk of being repaid. This is typically expressed as LIBOR + ‘x’ bps where the additional ‘x’ basis points (‘x’ hundredths of 1%) is what the bank charges for the risk of the loan.

**Coupon** – the coupon or interest rate of a bond defines the rate of interest paid on the bond. This interest can be paid annually, semi-annually or even every three months, depending on the way the bond is structured. The size of the coupon gives an indication of the credit risk of the bond. The higher the coupon, the more risky the issuer, as an investor will require a higher interest rate to compensate them for the greater likelihood of the issuer defaulting.

**Credit ratings** – there are three major rating agencies, Moody’s, Standard and Poor’s (S&P) and Fitch. They all have similar rating categories, which reflect the likelihood of default or a rating changing.

**Debt** – securities such as bonds, notes, mortgages and other forms of paper that indicate the intent to repay an amount owed. A cash payment of interest and/or principal is made at a later date. This is in contrast to an equity investment where there is an exchange of shares of common stock, or ownership of the company.

**Debt to Equity** – this ratio simply indicates the amount of debt from banks and the amount of equity from the various sources in a given project. Owners will generally want to introduce debt into a renewable energy project to reduce the overall cost of funds and enhance their returns, given that debt is cheaper than equity as it takes a lower risk position.

**Environmental risk** – environmental and social risks associated with the project, often subject to legal requirement for an impact assessment.

**Equity** – an investment in exchange for ownership of a company entitled to the earnings of a company after all other investors (eg debt-holders) have been paid.

**European Union Emissions Trading Scheme (EU ETS)** – a carbon market based on cap and trade, whereby binding emission targets are set by the EU and tradable allowances to emit up to these targets are then offered to emitters (as gifts or auctioned). Companies that pollute more can then buy surplus credits from those who pollute less, ensuring that overall emissions do not exceed the cap.

**Export Credits, Insurance, and other Risk Management Instruments** – used to transfer specific risks away from the project sponsors and lenders to insurers and other parties better able to underwrite or manage the risk exposure.

**Feed-in Tariff (FIT)** – a common mechanism for encouraging investment in renewable generation. A feed-in tariff is essentially a premium rate paid for clean generation, eg from solar panels or small wind turbines, and guaranteed for a long time period.

**Gilt** – a bond issued by the UK Government

**Greenhouse Gas (GHG)** – in the atmosphere, GHGs such as CO₂ trap sunlight as heat, thus contributing to the greenhouse effect which keeps the Earth’s surface warmer than it would otherwise be. The six GHGs defined by the IPCC comprise carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

**Index bonds** – those whose coupon and/or principal are not fixed but can change with reference to some sort of index. The best example of this is index linked gilts (“linkers”). Here, the coupon and principal rise (and fall) in line with inflation offering protection against inflation. Conventional bonds, although they may offer a higher initial interest rate, can see their real value whittled away in a high inflation environment. For this reason, pension funds and insurance companies with very long-term inflation linked liabilities like linkers. However, it is worth making a note that linkers suffer from significantly wider bid/offer spreads than conventional gilts, due to their lower liquidity.

**Individual Savings Account (ISA)** – is a financial product available to residents in the United Kingdom. It is designed for the purpose of investment and savings with a favourable tax status. ISAs were introduced on 6th April 1999, replacing the earlier Personal Equity Plans (PEPs) and Tax-Exempt Special Savings Accounts (TESSAs)

**Infrastructure Funds** – traditionally interested in lower risk infrastructure such as roads, rail, grid, waste facilities etc, which have a longer term investment horizon and so expect lower returns over this period.

**Institutional Investors** – includes insurance companies and pension funds, which tend to invest large amounts of money over a long time horizon with lower risk appetite.

**Internal Rate of Return (IRR)** – is used for each potential project as a key tool in reaching investment decisions. It is used to measure and compare the profitability of investments. Funds will
Unlocking investment to deliver Britain’s low carbon future

Market risk – 175 countries had ratified the protocol. See also: UNFCCC. thus helping to prevent climate change. By the end of 2007, reductions monitoring, reduction and/or trading with an objective of进入 force in 2005, by which parties agreed to engage in emissions monitoring, reduction and/or trading with an objective of reducing overall greenhouse gas inputs into the atmosphere, thus helping to prevent climate change. By the end of 2007, 175 countries had ratified the protocol. See also: UNFCCC.

Kyoto Protocol – a 1997 protocol of the UNFCCC, entering into force in 2005, by which parties agreed to engage in emissions monitoring, reduction and/or trading with an objective of reducing overall greenhouse gas inputs into the atmosphere, thus helping to prevent climate change. By the end of 2007, 175 countries had ratified the protocol. See also: UNFCCC.

Market risk – these assessments are typically provided by market specialists who report on topics including future electricity prices, future green subsidy prices, future carbon prices, and the prospect of new competitors.

Maturity – the maturity date of a bond is the date the investor gets his money back. There are a number of subtleties around the maturity date, but most bonds have a single fixed date. The further in the future the maturity date (the “longer” the bond), the more risky the debt as there is more time for the issuer to get into trouble. Indeed, some bonds (including the famous war loan from the UK Government) are “undated”, which means that the issuer never has to repay the debt. Undated, or perpetual, bonds often have features that allow the issuer to pay back the debt under certain circumstances: these are called “call options” and give the issuer the right, but not the obligation, to pay the lender.

Mezzanine finance – as its name implies, this type of lending sits between the top level of senior bank debt and the equity ownership of a project or company. Mezzanine loans take more risk than senior debt because regular repayments of the mezzanine loan are made after those for senior debt, however, the risk is less than equity ownership in the company. Mezzanine loans are usually of shorter duration and more expensive for borrowers, but pays a greater return to the lender (mezzanine debt may be provided by a bank or other financial institution). A renewable energy project may seek mezzanine finance if the amount of bank debt it can access is insufficient: the mezzanine loan may be a cheaper way of replacing some of the additional equity that would be needed in that situation, and therefore can improve the cost of overall finance and thus the rate of return for owners.

Monoline – a bond insurer that specifically insures the principal and coupons of bond issuers. The insurers take a fee and allow the insured bond to be rated at levels of up to AAA, whereas the stand-alone bond may be rated at A or below.

MtCO$_2$ – a million tonnes of CO$_2$, also known as one megatonne.

Operation and Management risk – once a project has been commissioned the plant will need to be properly maintained and staffed to ensure optimal performance. An assessment will be made of staffing and costs, as well as contracts required during the operational period and provisions required for decommissioning.

Pari-passu – refers to two or more loans, bonds, classes of shares having equal rights of payment or level of seniority.

Parts per million (ppm) – a measure of concentration often used for greenhouse gases in the atmosphere. One thousand parts per million is equivalent to 0.1% of dry air.

Policy and Regulatory risk – as the policy or incentive mechanism may be a key part of making renewable energy project economics attractive, changes to these factors pose a risk: a long-term, stable policy regime with a sound legal basis is essential for serious investment to occur. Regulatory risk is also considered for the permits, authorisations and licences required to plan, construct, operate and decommission renewable energy projects. A sound track record of stable and consistent regulation, well managed price or other reviews, and clarity over the development of regulations or policy to implement new renewable energy legislation, are important.

Private Equity – focus on later stage and more mature technology or projects, and generally expect to exit their investment and make their returns in a three to five-year timeframe.

Private Finance Initiative (PFI) – is a way of creating “public-private partnerships” (PPPs) by funding public infrastructure projects with private capital. Developed initially by the Australian and United Kingdom Governments, PFI projects aim to deliver infrastructure on behalf of the public sector, together with the provision of associated services such as maintenance.

Project Finance or Limited Recourse Finance – debt is borrowed for a specific project, the amount of debt made available will be linked to the revenue the project will generate over a period of time, as this is the means to pay back the debt. This amount is then adjusted to reflect inherent risks, eg the production and sale of power. In the case of a problem with loan repayment, rather like a typical mortgage, the banks will
establish first “charge” or claim over the assets of a business, as described above. The first tranche of debt to get repaid from the project is usually called “senior debt.”

Public-Private Partnership (PPP) – a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies. PPP involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project.

Refinancing – this is where a project or a business has already borrowed money but decides, or needs, to replace existing debt arrangements with new ones, similar to refinancing a mortgage. Reasons for refinancing include: more attractive terms becoming available in the market (perhaps as lenders become more familiar with the technology, meaning more money can be borrowed against the asset); or the duration of the loan facility, eg loans are often structured to become more expensive over time because of the increasing risk of changes to regulation or market conditions. One of the results of the financial crisis was that banks became extremely reluctant to lend for more than six or seven years, which “forced” projects that required longer-term loans to refinance in the future, and take the risk of the terms available at that time.

Regulated Asset Base (RAB) – with privatisation of the utilities, a new mechanism (the RAB) was created to provide credible commitments to investors. The RAB is backed up by an independent regulator with a duty to ensure that the utilities’ functions can be financed. In effect, the RAB receives investments once completed and the capital costs are then remunerated through the RAB and the duty-to-finance functions of the regulator.

Risk Capital – equity investment that comes from venture capitalists, private equity funds or strategic investors (eg equipment manufacturers). Besides the developers’ own equity and private finance, risk capital is generally the only financing option for new businesses.

Renewables Obligation Certificate (ROC) – a mechanism for subsidising and encouraging renewable energy generation in the UK.

Special Purpose Vehicle (SPV) – a discrete renewable energy business created around a project, in a legal form, to permit lending and equity investments, disconnected from other obligations or activities of a company. For example, a utility forming a joint venture with a partner will use an SPV as a clean legal structure for the enterprise. From a bank perspective providing project finance into an SPV can ensure it has uncontested rights over the assets, an equity investor will invest into an SPV often restricting its obligations to that SPV company and not linking it to the ownership of other activities of the investor.

Technological risk – each renewable energy technology will be assessed in the light of its maturity, operating history, fitness for purpose and warranties. The assessment will be undertaken by appropriate specialists often working closely with the technology supplier.

Underwriting and Syndication – A lead bank agrees to provide a large bank debt facility to a client for a particular project, but the loan will be larger than the bank itself can provide on its own for the long term. The bank receives a fee from the client for providing, or underwriting, the whole facility at the outset and taking the risk that it can “sell” pieces of the agreed loan to other lenders required (“syndication”), on terms and pricing already agreed with the client. The underwriting bank takes the risk that it has achieved the right balance of risk and return to attract enough other lenders into the transaction.

UNFCCC – The United Nations Framework Convention on Climate Change, which came into effect in 1994, was one of three international conventions that were opened for signature at the 1992 Rio Earth Summit. The others were the Convention on Biological Diversity and the Convention to Combat Desertification, and involve matters strongly affected by climate change. The UNFCCC provides the legal basis for its Kyoto Protocol, which sets binding targets for industrialised countries and the European community for reducing GHG emissions.

Venture Capital – focused on early stage or growth stage (depending on how far from the laboratory and commercial roll out) technology companies.

Wholesale – the sale of securities among broker-dealers and to large institutional investors. Securities sold at wholesale go for slightly lower prices than those paid by individual investors.
This report sets out the challenges facing the UK’s transition to a low carbon economy, the market failures and barriers to investment and the case for intervention to address them. It proposes the establishment of the Green Investment Bank (GIB) to tackle the low carbon investment needs of the UK, working as a key part of overall Government policy. The core arguments and recommendations of the Commission are highlighted below:

1. The scale of the investment required to meet UK climate change and renewable energy targets is unprecedented, with estimates of investment required reaching £550 billion between now and 2020. In contrast, only £11 billion was invested in Britain’s “dash for gas” during the 1990s, which was considered transformational at the time.

2. The Commission has identified a number of market failures and investment barriers in financing low carbon infrastructure, which have led it to conclude that, without intervention, the UK’s low carbon targets will not be achieved:
   - Market investment capacity limits and limited utility balance sheet capacity;
   - Political and regulatory risks stemming from the fact that government policy determines expected returns and the history of policy changes;
   - Confidence gaps among investors given technology risks, lack of transparency in government policy and high capital requirements for commercialisation;
   - The challenge of making large numbers of small, low carbon investments attractive to institutional investors.

3. In addition to ensuring the UK meets its legal decarbonisation targets, the case for intervention is supported by a number of arguments including:
   - Ensuring energy security and future growth;
   - Reduction of exposure to high and volatile fossil fuel prices;
   - Creation of a large number of new businesses and jobs;
   - Underlying externalities and market failures.

On this basis, the Commission argues for the establishment of the Green Investment Bank to work as part of overall Government policy to open up flows of investment by mitigating and better managing risk (rather than simply increasing rewards to investors).

4. The Commission recommends that the GIB be established “to support the delivery of the UK’s emission reduction targets as set by the Climate Change Act 2008. The support should be based on a public-private investment model and address specific market failures and investment barriers in a way that will achieve emission reductions at least cost to taxpayers and energy consumers.” The GIB’s mandate will involve:
   - Identifying and addressing market failures limiting private investment in carbon reduction activities (high priority);
   - Providing coherence to public efforts to support innovation in relation to climate change by rationalising existing Government-established bodies and funds (high priority);
   - Advising on financing issues in central and local government policy making.

---

1 Helm, D, Wardlaw, J & Caldecott, B, 2009, Delivering a 21st Century Infrastructure for Britain, Policy Exchange; Holmes, I & Mabey, N, 2010 Accelerating the Transition to a Low Carbon Economy: The case for a Green Infrastructure Bank, E3G
2 Climate Change Capital analysis
Operationally, the GIB should work under strict principles to ensure it does not crowd out the private sector, with the private sector leading and executing deals wherever activity is viable and the GIB operating only where its actions achieve a result that would not otherwise have been possible and then in partnership with the private sector wherever possible.

Based on consultation with stakeholders in the market, the Commission has proposed that over time the GIB could develop the following types of product:

- Early stage grants
- Equity co-investment
- Wholesale capital
- Mezzanine debt
- Offering to buy completed renewables assets
- Purchase and securitisation of project finance loans
- Insurance products
- Long-term carbon price underwriting

The GIB will need to raise three forms of funding to sustain its ongoing operations, leveraging the institutional appetite for long-dated sterling bonds and existing Government grants:

A Government funding for disbursement of grants (ie existing quangos and funds).

B Financing for ongoing activities and “commercial” investments, with options for Government consideration, including:
   i Green bonds
   ii Green ISAs
   iii Green Investment Bank debt fund
   iv Levy on energy bills, eg new levy or CERT replacement.

C Initial Bank capitalisation and funding, to support A and B and with options for Government consideration, including:
   i Private sector and state owned bank capitalisation, including use of bank levy and bank bonus taxes
   ii Proceeds from the sale of Government owned assets
   iii UK revenues from EU ETS auctions (could also be considered in ii above)

The Commission suggests that in its initial phase, the Green Investment Bank focuses on supporting the areas where maximum impact and speed to implementation can be achieved. For example, the scale up of investment in proven energy efficiency projects that can lower the overall development need of renewable energy sources; investment in enabling technology, such as smart grids, that reduce the cost for other low carbon investments; and support of both proven and high impact third-round offshore wind, should all be priorities.

The Green Investment Bank should be established by an Act of Parliament as a permanent institution working over the long term in the national interest. Any profits derived from public funds should be reinvested to further its mission.
The Commission recommends that:

- The Bank should be commercially independent and therefore not accountable to ministers or to Parliament for individual investment and lending decisions. This is a prerequisite for building credibility with the markets. It also should limit direct public liabilities by placing GIB liabilities off the Government balance sheet.
- While the GIB Bill is being drafted and going through Parliament, the Government should appoint a “shadow” board responsible for merging the various quangos and funds mentioned above, as well as laying the groundwork for the new Bank.
- The GIB’s governance structure should clearly manage the tension between investing in the public interest and the need to be commercial. The board of directors should be drawn primarily from the private sector and employees should have commercial expertise.

10 A number of immediate actions will be critical to the success of the GIB to ensure that the Bank is established and becomes active as soon as possible (our target is within six months of this report). Rapid mobilisation will avoid the potential for investors to take a wait-and-see approach:

- Selection of a strong and effective board to ensure the Bank is functioning and that products are defined and established as soon as possible.
  - For example, the non-executive chairman should be selected by August 2010, the board (or shadow board) by October 2010.
  - The initial establishment of the Green Investment Bank should not be dependent on the finalisation of overall Government policy or passage of the establishing Act.
- In preparation for the Comprehensive Spending Review in October 2010, immediate further analysis will be required to ensure that the GIB is adequately capitalised and to determine the Government’s exact requirements before October.
- In light of the recent National Audit Office report entitled, Government funding for developing renewable energy technologies, the GIB should use the potential rationalisation of quangos and their funds to radically improve Government support for low carbon innovation and the commercialisation of new technologies.
  - The process of bringing together and rationalising these quangos and funds should happen quickly, with the savings secured being reinvested in the new institution.
  - The rationalisation process should ensure value for the taxpayer, while improving service delivery and simultaneously freeing up money to support Britain’s transition to a low carbon economy.
  - The high quality of people and skills in some of the existing quangos should form the core of the GIB.
- Further analysis of the role of the GIB across the UK and the involvement of the devolved administrations in GIB governance and capitalisation.
- Further analysis of the implications of the GIB for overall Government policy and for the role of existing institutions such as Infrastructure UK.
- Initiation of the process to prepare an Act of Parliament to establish the GIB.
Unlocking investment to deliver Britain's low carbon future
1 The size and nature of the green investment challenge

SECTION CONCLUSION: The investment required to meet UK climate change and renewable energy targets is on a scale not seen since post Second World War reconstruction. Action is needed now to facilitate the required investment to safeguard our future.

£800 billion to £1 trillion of investment is required by 2030 to replace, upgrade and decarbonise Britain’s infrastructure. This £40 to £50 billion annual requirement substantially exceeds the historical average and is on a scale not seen since reconstruction after the Second World War.

This investment need is the consequence of decades of underinvestment – especially in energy, but also in energy security and technological change – and is driven by the imperative to create a low carbon economy. The transition to a low carbon economy must be achieved rapidly if the UK is to meet its legally binding target for 2020 of reducing greenhouse gas emissions by 20% relative to 1990 levels and by 80% for 2050.

Substantial increases in investment are required across most infrastructures, but some sectors will require more dramatic increases than others. In the energy sector, for example, the next five years requires investment at double the rate of the previous five years. Meeting the UK’s energy policy commitments alone will require over £200 billion between now and 2020. In contrast, only £11 billion was invested in Britain’s “dash for gas” during the 1990s, which was considered transformational at the time.

Many experts have attempted to estimate the amount of investment required to create a low carbon Britain. The sheer variety of infrastructure required – offshore wind, nuclear power, carbon capture and storage, networks, gas storage, biomass, solar, ports, high speed rail – makes such estimates difficult. However, a triangulation of the most recent studies indicates that low carbon infrastructure and related supply chain investment will need £550 billion (or up to £55 billion a year) by 2020. By comparison, in 2009 the entire global spend on clean energy and clean technology was £97 billion ($145 billion), of which the UK share was only £6-7 billion.

This investment need is the consequence of decades of underinvestment and is driven by the imperative to create a low carbon economy.

Decarbonising the UK’s economy requires substantial investment in many areas that generate greenhouse gas emissions – predominantly in energy generation and distribution, where the production of electricity, heating, cooling and steam...
accounts for half of worldwide carbon emissions. With energy the largest carbon emitter, investments in low carbon and renewable technologies and infrastructures are a “must”. These investments, however, will need to take place at two different levels:

1. Large-scale energy efficiency, low carbon and renewable generation and infrastructure investments; at this level some of the most important measures required to achieve the UK’s carbon reduction targets are:
   - Ambitious reduction in demand for energy through industrial and commercial investment in energy efficiency;
   - Significant capital investment in low carbon and renewable generation and infrastructure capacity:
     - To increase industrial and large-scale combined heat and power plants (CHP);
     - To ensure adequate flexible and peaking generation capacity and system stability with high penetration of variable output renewables;
     - To develop and install carbon capture and sequestration (CCS) technology for coal fired power plants;
     - To increase large-scale renewable generation capacity (on and offshore wind);
   - To reinforce electricity transmission, distribution and interconnector network.

2. Medium to small-scale energy efficiency, local “on-site” low carbon and renewable generation and infrastructure investments, including:
   - Small-scale energy efficiency, local “on-site” low carbon and renewable generation and infrastructure investments.
   - Significant growth (from almost zero today to 12% of the total UK energy mix by 2050) of the residential and commercial low carbon and renewable “on-site” generation is needed.

Certain technologies, such as smart metering and smart grids are critical for enabling other low carbon technologies to flourish. Similarly, investment in demand management and energy efficiency can reduce the total infrastructure required, both saving money and supplying proven technology ready to be scaled up.

---

10 Climate Change Capital analysis
11 Dow, K and Downing, T, The Atlas of Climate Change. Share by sector of annual total 2000: land, deforestation and agriculture account for 31%, transport, shipping, aviation 14% and water and waste 5%
12 Low carbon energy investments represent the single largest capital expenditure (£260 billion) within the overall £800 billion to £1 trillion of capital required by 2030 to decarbonise the UK economy according to Infrastructure UK. National Grid estimates that it will represent on average £200-£400 additional annual cost per household. The remaining investments are needed in transportation, water, waste and reforestation.
13 See Annex 1 for details on size and nature of decarbonising UK electricity and heat from 2010-30
14 National Grid
Each technology has a different mix of carbon savings, capital costs and levels of technological maturity. Consideration of these factors will be critical in deciding which technologies to prioritise to maximise the speed and minimise the cost of our transition to a low carbon economy. Certain technologies, such as smart metering and smart grids are critical for enabling other low carbon technologies to flourish. Similarly, investment in demand management and energy efficiency can reduce the total infrastructure required, both saving money and supplying proven technology ready to be scaled up.

Some argue that good government policies and waiting for the financial market to return to “normal” after the credit crunch will be enough to deliver the necessary investment. We disagree. Even a return to the “old normal”, which is not likely, would not accommodate the unprecedented scale, urgency and nature of the challenge. The only sensible plan given the conclusion of the Stern Review is to act now to facilitate the required investment needed to safeguard our future.

Even a return to the “old normal”, which is not likely, would not accommodate the unprecedented scale, urgency and nature of the challenge.
Unlocking investment to deliver Britain's low carbon future
2 Market failures and barriers to investment

SECTION CONCLUSION: The Commission has identified a number of market failures and investment barriers in financing low carbon infrastructure, which lead it to conclude that, without intervention, the UK's low carbon targets will not be achieved:

• Market investment capacity limits and limited utility balance sheet capacity.
• Political and regulatory risks stemming from the fact that government policy determines expected returns and the history of policy changes.
• Confidence gaps among investors given technology risks, lack of transparency on government policy and high capital required for commercialisation.
• The challenge of making a large number of small, low carbon investments attractive to institutional investors.

To assess the ability of the UK to meet these challenges and deliver the necessary investment, we consulted widely on which projects would be delivered by the market inside expected policy frameworks, which would not be and the market failures and investment barriers that cause the shortfall. In addition, because of the ongoing global banking and investment constraints, we examined whether previously working markets had ceased to function. We identified four fundamental barriers to the necessary investment, discussed in the next chapters, that require an immediate and tailored response:

• Market investment capacity limits.
• Political and regulatory risk.
• The confidence gap.
• The aggregation challenge.

Market investment capacity limits

More mature low carbon technologies, such as large scale on and offshore wind, require large amounts of long-term debt and equity finance. Long-term, reasonably priced debt, in particular, is required to provide equity investors with the necessary returns and to lower the cost of electricity to the consumer. Today, these pools of capital are neither large nor long enough.

The problem we face is akin to trying to build substantial new housing stock without the existence of a 20-25 year mortgage market. Today, long-term debt for these projects is supported either through utility balance sheets via the bond market or through direct bank loans known as project finance. Utilities face uncertain energy demand, increased borrowing costs and the need to reduce their leverage to protect their credit ratings and other demands for their capital – at the same time we need massive new investment. Furthermore, most of the UK’s large utilities also operate in other European countries, where there are equally pressing demands to invest, sometimes with more certain regulatory structures and therefore more certain economic returns. As we all know, many commercial banks currently have much reduced access to capital.  

The competition for capital, whether inside banks or utility companies or between countries in Europe, means that low carbon investments – perceived by many to be riskier – are unlikely under current market conditions to attract the capital needed within the time desired. This is particularly true given that the

---

15 Hamilton K, 2009, Summary note from 2009 Q4 roundtable discussion with project financiers and discussion with the Carbon Trust
16 Citigroup, 2009, Pan-European Utilities: The €1,000,000,000,000 decade
17 See Annex 2
current carbon pricing regime does not present a sufficiently stable price signal for investors to select low carbon over high carbon projects. Indeed, Figures 2 and 3 illustrate that only a small portion (less than 15%) of likely low carbon investment requirements for the UK is in place, and that a fundamental change is needed if the projected investment of up to £55 billion a year is to be achieved.

Utilities face uncertain energy demand, increased borrowing costs and the need to reduce their leverage to protect their credit ratings and other demands for their capital – at the same time we need massive new investment

### Political and regulatory risk

Political and regulatory risk is of particular significance for technologies related to decarbonisation because of the reliance of the market on government intervention (subsidies, renewable obligation contracts). The question from an investor perspective is whether to trust politicians to maintain policies that would force future customers to pay for long enough to ensure their return is generated 15-20 years on. History is littered with examples of private sector investments being made on long-term promises only to see regulatory regimes change and returns reduce with them. Ex-ante capital costs have exposed investors to ex-post expropriation through the political and regulatory process. Project operators with years of sunk cost and low operating marginal cost have no choice at this point but to continue to operate the projects on lower returns than anticipated. Since investors cannot control the political and regulatory risk, this translates into a higher cost of capital. We believe this is a major deterrent to investment in long-term low carbon projects.

### Confidence gap

Many of the new technologies needed to deliver decarbonisation are at an early stage and face obstacles to commercialisation and scale-up that are the result of significant barriers:

- The “valley of death” – a gap between the initial grant and research funding available to emerging technologies with high capital costs at the outset and the private sector funding they need later to demonstrate commercial viability. The longer it takes to develop – wave and tidal technologies can take as long as 15-20 years to come to market – the deeper the valley of death.
- The challenge of attracting capital from the global venture capitalist (who finance early stage development), but the technological or execution risk is too high for private equity and project finance investors (who finance diffusion). Carbon capture and storage, energy efficiency finance and second generation biomass are traditionally identified as sitting in this space. It is arguable that the same could be said for the initial development of UK deep offshore wind projects. See discussion in Commodities Now, 23rd June 2009, “Valley of death for low carbon technologies is widening”, http://www.commodities-now.com/news/environmental-markets/190-valley-of-death-for-low-carbon-technologies-is-widening.html

---

18 HG Capital
19 Bloomberg New Energy Finance
20 Technologies get caught in the “valley of death”, where later stage low carbon investments are often considered too capital intensive for a venture capitalist (who finance early stage development), but the technological or execution risk is too high for private equity and project finance investors (who finance diffusion). Carbon capture and storage, energy efficiency finance and second generation biomass are traditionally identified as sitting in this space. It is arguable that the same could be said for the initial development of UK deep offshore wind projects. See discussion in Commodities Now, 23rd June 2009, “Valley of death for low carbon technologies is widening”, http://www.commodities-now.com/news/environmental-markets/190-valley-of-death-for-low-carbon-technologies-is-widening.html
capital funding market. There are three types of fund at work in the UK market:

- Venture capital funds which take early stage technology risk;
- Private equity funds which take limited technology risk but will take project development risk and some market adoption risk;
- Infrastructure funds which take no technology or development risk but will generally take construction and operation risk (see Annex 3 for more details).

For all these investors, as the risks decline the returns demanded by their institutional backers also fall. If the UK had a perfect balance of each of these funds, technologies and projects, it would be able to find the right type of capital at the right time. However there is not a perfect balance in the UK market at all levels and therefore funding gaps emerge as the funds designed to take each type of risk are not adequately provided at exactly the right point in the development chain.

- Scalability – small projects may offer unattractive economic returns for many banks and investors. Several banks explained that modest local projects, for example those requiring debt of less than £20 million, involve the same transaction and diligence costs as large projects and require the attention of a limited pool of qualified staff. To maximise their effectiveness and the time of their investors, banks focus on larger projects. Several equity investors noted the same concern.
- A lack of clarity on business models, some of which are likely to be based on public-private structures, or on the source of returns for new and as yet unregulated infrastructure assets such as a CO₂ transport network, electric car charging networks, heat networks or smart grids (linked to political risk described above).
- Finally, the plethora of Government bodies involved in this area (discussed later in this report), and the mixed history of PPP/PFI programmes, have made a number of projects too complex for insurance and pension fund investment. Such funds will require greater certainty about the legislation governing the returns generated by these projects and more transparency on the funding process and parties involved before they will invest.

The aggregation challenge

One of the essential elements in delivering a low carbon Britain is to introduce energy efficiency improvements such as high efficiency windows, lighting, temperature control and more efficient boilers in millions of homes and commercial buildings in the public and private sectors. This large number of small investments could easily add up to more than £100 billion. Making that happen will require co-ordination between individuals, private companies, finance sources and public policy. Such co-ordination does not currently exist. The challenges of aggregation, making funds available and then repaying them, deal execution and transaction cost management are surmountable, but the current institutional frameworks and capital markets are unlikely to execute what is required. “Retrofitting” older homes with new energy saving appliances is a perfect example because of the huge number of small buildings involved. Community renewable energy projects are another: a substantial pipeline of viable projects exists but a lack of financial and legal expertise combined with a lack of equity funding is preventing these deals from going ahead.\(^\text{21}\)

The sheer scale of the projects will require a nationally co-ordinated response.

Addressing investment barriers

The Government can address the four main barriers to investment in the following ways:

1. Investment – by investing alongside the private sector government can help to address the scale issue and can leverage public sector investment many times over with private sector finance.
2. Reducing uncertainty of returns – by establishing coherent long-term regulatory frameworks that provide clarity on cashflows and investment timescales.
3. Mitigating risks – by providing guarantees and insurance facilities a free market would not provide.
4. Raising rewards – by providing higher subsidies at critical points in a project’s lifecycle to prompt the market to invest, or removing subsidies for existing carbon-intensive modes of power generation to help level the playing field for cleaner energy and improve comparable rates of return for investors (highlighted in the G20 agreement in Pittsburgh in September 2009). However, the Commission argues that it is better to open up flows of investment by mitigating and better managing risk, rather than simply providing higher subsidies.

The remainder of this report looks at how this can be achieved at minimum cost to the taxpayer and energy consumer.

\(^{21}\) Discussions with the Co-operative Bank
Unlocking investment to deliver Britain's low carbon future
The case for intervention

SECTION CONCLUSION: The Commission argues that, under current policy and market conditions, private finance will not be available at the scale, scope or speed needed to deliver the Government’s objectives. In addition to ensuring that the UK meets its legally binding decarbonisation targets, the case for intervention is supported by:

- Ensuring energy security and future growth.
- Reducing exposure to high and volatile fossil fuel prices.
- Creating a large number of new businesses and jobs through infrastructure investment.
- Compensating for underlying externalities and market failures.

The Commission proposes that a Green Investment Bank be established, to work as part of overall Government policy, to open up flows of investment by mitigating and better managing risk, rather than simply increasing rewards to investor.

The low carbon transition will be a 40-year process requiring unprecedented investment in new technologies, new infrastructure assets and the supply chains to deliver them. Given the state of the public finances, funding this transition vastly exceeds the capability of the public sector. Consequently, private sector investment on a much larger scale than hitherto will be essential to deliver the required capital.

Institutional investors, with their long-term liabilities and vast pools of capital could provide a significant proportion of the funds. It is critical that we access these resources. However, this will only happen if they are able to earn adequate risk-adjusted returns and if appropriate market structures are in place to access this capital. Institutional investors, such as the £1.5 trillion of UK pension fund assets under management, tend to invest in equities, fixed income products, gilts and property. They do not typically invest in debt on a project by project basis, nor do they usually take on direct construction

22 The former Chancellor Alistair Darling announced that capital expenditure will be halved from £44 billion this year to £22 billion by 2013-14
risk. Single project debt products are not currently available in the UK, though the World Bank, International Fundraising Congress (IFC) and others have issued green bonds, which now amount to more than $1 billion. We believe that a properly structured green bond would be one way of accessing institutional resources. In designing products to reach this vast institutional market, we also need to be aware that pension trustees are charged with delivering pensions to millions of workers and approach new investment areas cautiously. Work needs to start immediately if the capital is to be available in the timeframe required.

We believe that a properly structured green bond would be one way of accessing institutional resources

Some will argue that the free market should be left to tackle the challenges of the low carbon economy, and that any entity intervening to support the financing of low carbon projects should only act commercially. Section 2 demonstrates that targets will not be met if action is left to the markets. Basic economic theory provides useful support for intervention:

1 Current policy does not charge those responsible the full costs of their carbon emissions. In the absence of more robust measures (carbon taxes, cap and trade, regulation) a subsidy for reducing emissions which produces a positive externality is justified.

2 The low carbon technology industry is in the early stages of an industrial revolution. This means that there is a tendency for the market to “wait and see” and capitalise from emerging R&D investments rather than investing in them now. Direct R&D subsidies, special taxes or grants can be used as a mechanism to bring forward investment.

3 Finally, reducing the risks associated with changes in government policy and the nascent state of clean energy technology for example, can provide a positive externality to all.

Indeed further positive externalities result if intervention is successful:

- The long overdue need to replace many areas of critical infrastructure would ensure energy security and underpin future growth.
- Investment in efficient low carbon infrastructure would reduce the UK’s exposure to high and volatile fossil fuel prices.
- Infrastructure investment would create large numbers of new businesses and jobs, helping economic recovery and creating export opportunities.

The nature of the challenge

For the UK, funding the decarbonisation challenge can broadly be broken down into issues related to:

- The provision of finance – where there are concerns about the scale of funds needed, the contraction of capital markets, coupled with the need for banks to be resilient in the face of future cycles.
Policy frameworks – lack of market traction, political risk implicit in support mechanisms, balancing risk/reward in the financing of new technologies and funding public infrastructure. We noted previously that some have argued good government policy design combined with waiting for the market to return to “normal” will be enough to deliver decarbonisation. We do not believe this is the case. Significant government intervention – financial and in terms of policy frameworks – will be required to deliver public infrastructure such as CO₂ pipelines and high-speed rail but also to accelerate the roll out of new low carbon technologies and supporting services. It is likely that there will be different phases of financial focus during the delivery of this transition, each with associated policy challenges (Figure 4).

Figure 4. Three phases of financing

Financial Recovery → 2014?
Scaling-Up → 2018?
Mainstreaming → 2025?
Different Policy Issues at Each Stage

Short term – financial recovery

With the creation of innovative financial interventions come opportunities to deliver a green economic recovery – energy efficiency investment in homes and small businesses being a prime example. There is also a need to maintain investment momentum more generally by addressing the immediate financing gap facing low carbon projects and companies which generally require large-scale capital over long time periods. In the current economic climate, investors prefer to reduce their exposure to such riskier, less established companies and technologies, and it is unclear how long the markets will take to become less risk averse again. Thus the scale and term of debt funding and equity for technologies are urgent issues.

Medium term – scaling up

A framework for the rapid mobilisation of capital at scale is required for the medium term. Government effort should focus on reducing investor risk, increasing the availability of capital and instigating institutional reform. Above all it must ensure that low carbon investments are offering the same level of risk-adjusted returns as high carbon ones in order to attract capital into the sector. Policy must be precise and transparent and designed with a high degree of financial literacy so that investors are given the certainty they need and public finance is effectively targeted. Focusing on specific projects with the ability to be profitable rapidly can also help to attract this capital by demonstrating that it is possible to earn appropriate returns. Public funding for low carbon technologies and business is likely to peak by 2020, by when they will be starting to become commercial, enabling preparation for the next stage.

Long term – mainstreaming

Economies of scale will reduce costs and install a new set of low carbon technologies and businesses. As this happens, we would expect private sector refinancing to enter the arena and the public sector to step back, the scale of its support tailing off.

23 Aldersgate Group, 2009, Financing the Transition: a strategy to deliver carbon targets
24 A forthcoming report from WWF notes that more than 100,000 jobs a year could be created in the energy efficiency market to 2020
25 The notion of “investment grade policy” is discussed in Hamilton, K, 2009, “Unlocking finance for clean energy: the need for investment grade policy”, Chatham House
Unlocking investment to deliver Britain's low carbon future
The role of the Green Investment Bank

SECTION CONCLUSION: The Commission recommends that the Green Investment Bank be established to support the delivery of the UK’s emission reduction targets as set by the Climate Change Act 2008. The support should be based on a public-private investment model and address specific market failures and investment barriers in a way that will achieve emission reductions at least cost to taxpayers and energy consumers.

The Green Investment Bank should work to facilitate private investment in low carbon assets at the scale and speed needed to meet our legally binding emission reduction targets until such time as the market can do this alone.

Objectives and Scope

The Green Investment Bank would help Britain to deliver its low carbon future at least cost and with maximum impact over time. It would support the delivery of the UK’s low carbon transition by catalysing additional investment in the infrastructure and technologies needed to mitigate and adapt to climate change. The GIB would achieve this by:

- Increasing the availability of capital;
- Better channelling existing Government resources;
- Bridging to financeable market risk.

The Bank would operate independently of Government. As a result, its liabilities should not appear in the National Accounts and it would be able to provide independent advice to Government. By providing coherence to private and public efforts, the Bank would also become a centre of excellence, able to identify and reduce the barriers to private sector investment.

Aims of the GIB

The Green Investment Bank should have this mandate:

- To support the delivery of the UK’s emission reduction targets as set by the Climate Change Act 2008. The support should be based on a public-private investment model and address specific market failures and investment barriers in a way that will achieve emission reductions at least cost to taxpayers and energy consumers.
  - It would aim to stimulate equity investments and debt capital flows to fund the priorities identified by the Committee on Climate Change.

The Bank would operate independently of Government. As a result, its liabilities should not appear in the National Accounts

The three principal strategies for delivering this mandate would be:

1. To identify and address market failures and investment barriers limiting private investment in carbon reduction activities.
   - Increasing the availability of capital, for example by supporting debt and equity syndication market to facilitate investments in carbon reduction activity
   - Reducing unacceptable market risk that prevents private sector activity by providing risk mitigation mechanisms for the private sector
   - Developing standardised financial products/instruments for investment in projects it has promoted and vetted where a specific market failure or funding gap exists

The Bank would also become a centre of excellence, able to identify and reduce the barriers to private sector investment
At both policy appraisal and evaluation the Green Investment Bank would be an integral part of the process and provide independent advice to Government on the implications and effectiveness of climate change policies, especially with regards to financing and investment.

2 To provide coherence to public efforts to support innovation in relation to climate change by rationalising existing Government established bodies and funds.
   • Providing one contact point for investors for Government funding in place of the current multiple sources.
     – Only Government organisations that tackle the market failures in raising finance for carbon reduction technologies would be considered (first stage to consider largest entities by funding for renewable generation/energy efficiency activity).
     – The Bank would provide the focal point for allocating the UK’s share of funds raised from auctioning allowances through the EU Emission Trading Scheme.26
   • Administer grants/support for venture capital/early stage investment to encourage greater consistency of subsidy across technologies.
     – The Bank should provide grant or zero-interest funding to early stage projects to help to secure private funding where it would otherwise not have been possible based on existing Government commitments.
   • Tie together different investor groups in projects by simplifying funding processes and aggregating/consolidating investment across many projects.

3 The Bank would have the potential to become an adviser to Government on matters related to the financing of green policy.
   • At both policy appraisal and evaluation the Green Investment Bank would be an integral part of the process and provide independent advice to government on the implications and effectiveness of climate change policies, especially with regards to financing and investment. The GIB should not be a policy-making agency but would use its expertise to inform policy formulation.
     – The GIB would provide independent feedback on the financing implications of the Government’s market reform proposals, feed-in tariff policy and the energy efficiency programme for the wider public sector.
   – Note that Infrastructure UK is an advisory body within the Treasury, whose scope as it relates to financing of green policy may need to be reviewed in light of the establishment of the GIB.

At the start, the Green Investment Bank would focus on its financing and co-ordination roles to ensure it achieves its mandate. It should also prioritise providing advice on central Government policies with large financing implications – for example the process of energy market reform. As the Bank evolves and grows, its advisory role could expand to include local authorities and communities – identifying and quantifying explicit and implicit subsidies to carbon intensive industries and aiding more efficient resource and capital allocation.

As the Bank evolves and grows, its advisory role could expand to include local authorities and communities.

4 The Green Investment Bank could play an international co-ordination role on green investments.
   • Provide support to enable the UK to meet its international commitments on climate change finance in the developing world.
   • Maximise the deployment of equity and debt capital from EU sources such as the European Investment Bank and the Marguerite Fund (the pan-European 2020 European Fund for Energy, Climate Change and Infrastructure), and potentially EU Emission Trading Scheme allowances.

Operating principles

A number of operating principles have been developed:

1 Wherever private sector activity is viable, the private sector, banks and investors should lead and execute deals.
   • In these circumstances, the Green Investment Bank would not take the lead in originating, sponsoring or structuring investments. Rather it would co-invest in opportunities brought to it by the private sector (for example, supporting the banking sector to lend). The GIB would act as an enabler for the private sector.
   • The Bank would commit the minimum resources required to support these functions.

2 The Green Investment Bank would operate only where its action would serve to achieve a result that would not have otherwise been possible.

---

26 It is still unclear whether after 2012 this will be undertaken centrally via a platform selected by the European Commission or as now in a decentralised fashion by UK DMO.
• The Bank would participate only where involvement would accelerate market activity and where its absence would leave activity unviable.
• This would ensure no crowding out of the private sector – the Bank would facilitate and not compete with private sector investment.

The Green Investment Bank could play an international co-ordination role on green investments

3 The Green Investment Bank should aim for commercial rates of return for its banking operations.
• For its banking operations (excluding distribution of existing Government funding) the GIB should be self-funding, raising funds from the capital markets and investing commercially with the private sector. There are successful examples such as 3i, CDC, and IFC.27
• As a starting point, the Bank will apply the Treasury Green Book principles to appraise projects and determine their rates of return. These principles clearly set out how taxpayers’ money should be allocated responsibly in green investments and indicate how risks should be managed and environmental impacts valued. Those projects with the largest impact and highest speed to market should be prioritised. For example, the Commission considers that the successful scaling up of investment in proven energy efficiency projects, investment in enabling technology such as smart grids that reduce costs for other low carbon investments and support of both proven and high impact third-round offshore wind, all warrant immediate consideration by the GIB.
• The GIB should separately run funding operations, potentially on non commercial terms, for early stage projects unable to secure private funding. These are to be drawn from allocated Government funds. In doing so, the GIB should consider the lessons and implications highlighted in the House of Commons Committee of Public Accounts report on venture capital support to small businesses28. The recommendations of the report set out the importance of establishing a clear set of economic and financial objectives for the funds, a process to ensure evaluation of investments over time, strong risk sharing with the private sector, control of management fees, avoidance of regional inequalities and consistency of investment decisions across different Government funding bodies.
• Both portfolios would be independent of cyclical events and focused on long-term returns.
• Profits/surpluses would be reinvested and no dividends paid on bank equity.
• The risk appetite for the enterprise would be set ab initio and monitored by the board subsequently.

4 The Green Investment Bank would be structured as an independent institution in order to ensure that Government exposure is limited as far as possible to its shareholding and debt raised is non-recourse to Government.

28 House of Commons Committee of Public Accounts. Department for Business, Innovation and Skills: Venture capital support to small businesses, 01 March 2010
Unlocking investment to deliver Britain's low carbon future
5 How the Green Investment Bank would raise money and invest

SECTION CONCLUSION: Based on consultation with stakeholders in the market, the Commission proposes that the GIB could develop the following types of products:

- Early stage grants
- Equity co-investment
- Wholesale capital
- Mezzanine debt
- Offering to buy completed renewables assets
- Purchase and securitisation of project finance loans
- Insurance products
- Long-term carbon price underwriting

In parallel, the GIB would need to raise three forms of funding to ensure that it is able to sustain its operations:

A Government funding for disbursement of grants (ie existing quangos and funds).
B Financing for ongoing activities and “commercial” investments (with options for Government consideration including green bonds, green ISAs, levy on energy bills).
C Initial Bank capitalisation and funding (with options for Government consideration including private sector bank capitalisation, use of bonus/bank taxes, sale of Government owned assets or UK share of ETS auction proceeds).

The following section outlines what products and services we think the Green Investment Bank should provide. In doing so, we make an important distinction between the sources and the uses of funds; between how the Bank raises funds and how it provides funds to projects and companies. In selecting the right mix of funding sources and the most efficient use of its resources, it must take account of new regulations such as the Retail Distribution Review and the EC Alternative Investment Fund Managers Directive.

Sources of funds

A number of potential funding sources have been considered for the Green Investment Bank. It is important to note that this Commission is not making a recommendation on which government related funding sources should be used – it is up to the Government to decide on the combination of funding sources used to reach the level of funding recommended. These will need to cover the Bank’s initial capitalisation (to support its activities on the capital markets) as well as any equity and debt investments required to support its mandate. The amount of funding required will depend on Government policy on the low carbon transition (ie subsidies, policy frameworks). The Commission recommends further analysis, as Government policy is finalised, to determine a business plan for the Bank.

The Commission recommends further analysis, as Government policy is finalised, to determine a business plan for the Bank.
1 Government funding for disbursement of grants (ie existing quangos and funds).

2 Financing for ongoing activities and “commercial” investments:
   A Green bonds
   B Green ISAs
   C Green Investment Bank debt fund
   D Levy on energy bills, eg a new levy or replacement of the Carbon Emissions Reductions Target (CERT)

3 Initial Bank capitalisation and funding to support 1 and 2:
   A Private sector and state owned bank capitalisation, including use of bank levy and bank bonus taxes.
   B Proceeds from the sale of Government owned assets.
   C Revenues from EU ETS auctions. (This could also be considered in 2).

Ad hoc Government initiatives have resulted in a large number of Government funded quangos and funds backing low carbon innovation and commercialisation in Britain. While these efforts should be commended, the delivery of this support could be radically improved.

The Commission has initially identified three quangos and six funds that could be brought into the Green Investment Bank

Ad hoc Government initiatives over the preceding decade, have resulted in a large number of Government funded quangos and funds backing low carbon innovation and commercialisation in Britain. While these efforts should be commended, the delivery of this support could be radically improved. The disparate collection of institutions and funds, often with similar objectives and very little accountability for the delivery of specific goals, has resulted in duplication and inefficiencies that rationalisation would reduce.

The lack of co-ordination and common branding has also made it hard for businesses and investors to navigate the bureaucracy. The creation of a unified point to advise and inform them about how to access grants or participate in Government supported schemes, as well as about the opportunities created by the transition to a low carbon economy, would help resolve this issue.

The process of bringing together and rationalising these quangos and funds could happen quickly, with the savings secured being reinvested in the new institution. The rationalisation process would ensure value for the taxpayer, while improving service delivery.

The Commission has initially identified three quangos and six funds (see above and Figure 6) that could be brought into the Green Investment Bank under a common brand, a coherent strategy and a governance structure that would reduce overheads, improve effectiveness/returns and enable co-operation.

---

29 http://www.carbontrust.co.uk/publications/pages/publicationdetail.aspx?id=CTC757
31 http://www.bis.gov.uk/Policies/science/science-funding/energy-technologies
32 http://www.decc.gov.uk/EnContent/cms/what_we_do/change_energy/tackling_clima/intl_strat/etf/etf.aspx
33 http://www.ofgem.gov.uk/Network/ElecDist/lcnf/Pages/lcnf.aspx
38 National Audit Office, 2010, Government funding for developing renewable energy technologies
39 Ibid
Clearly the list can be reviewed and amended. The quangos have an estimated annual budget of £185 million and the funds are worth approximately £2 billion. Some of this funding has been spent already or will expire in due course, so that the available pool may be reduced.

The process of bringing together and rationalising these quangos and funds could happen quickly, with the savings secured being reinvested in the new institution. The rationalisation process would ensure value for the taxpayer, while improving service delivery and freeing up money to support Britain’s transition to a low carbon economy.

Financing of ongoing activities and “commercial” activities

Green bonds
We have already touched on the potential of UK pension funds and other institutional investors to channel long-term pension savings into infrastructure projects, matching long-term savings with infrastructure investment need. Pension funds and life insurance companies have long-term investment horizons with liabilities averaging 20 years or more. Their investing is naturally driven into equities and long-term bonds, which fits well with climate-related projects. It is therefore likely that insurance companies and pension funds will be the largest investors in climate related companies and projects.

Data from the Pensions Regulator shows that gilts and fixed interest bonds have increased from 28% to 37% of defined benefit pension schemes since 2006. This trend away from equity and into debt investment is growing because of liability-driven strategies and increasing moves to prepare for buyout. (The recent shift is also due to the "denominator effect", as listed equity portfolios have fallen in value compared to bonds over recent years, as well as the closure of final salary schemes). Since direct investments in infrastructure account for less than 5% of their total allocation, traditional UK pension funds are, in general, a more likely source of debt financing than equity funding.

The potential of UK pension funds is mirrored by the insurance industry. Legal & General estimates that UK annuity providers comprise 25% of investment in the corporate bond market and 36% of the long-dated sector of that market. The annuity market is estimated to be £137 billion but the lack of supply of high-quality sterling bonds is driving such funds to invest in non sterling assets. This is not only suboptimal because they have to incur costs for swapping cashflows back to sterling to match the UK annuity liabilities, but it also suggests the existence of substantial potential demand for bonds issued by the Green Investment Bank – up to £10 billion per annum on some estimates. Furthermore, the requirement for annuity funds tends to be long-dated, and rated in the A to BBB categories. This means that the green bonds issued by the World Bank and European Investment Bank are too highly-rated to be of much use to these types of funds, creating a real demand for a new type of long-dated instrument (to be discussed below).

For green bonds to be attractive to some institutional investors they may need to be rated by an external agency. The market will need to be deep enough and long-dated enough to provide the necessary liquidity.

If this substantial demand is to be channelled to green bonds, a number of constraining factors will need to be addressed. First, for green bonds to be attractive to some institutional investors they may need to be rated by an external agency. The market will need to be deep enough and long-dated enough to provide the necessary liquidity to allow purchasers to move in and out of it with some ease. If there is not enough liquidity some institutional investors may shun this class of assets in favour of existing Government bonds. Secondly, pension funds and insurance will require a good reason to shift from gilts, private equity, venture capital or real estate.

Green bond overview
Green bonds could be utilised in two capacities: as a means of financing the Green Investment Bank (where the GIB is the issuer), and/or lowering the cost of debt for projects where the GIB or the Government provides risk mitigation for the project debt (where the project is the issuer).

Green bonds could be utilised in two capacities: as a means of financing the Green Investment Bank or lowering the cost of debt for projects

Green bonds targeted at institutional investors could take the following forms:

- Single project bonds, providing exposure to specific projects supporting the low carbon transition.
- Bonds directly funding asset portfolios (eg residential energy efficiency/Green Deal, onshore wind, offshore wind, residential solar), or more realistically taking out Green Bank loan funding.
- Secondary project finance loans, bought from commercial banks and also bundled by asset class.
Unlocking investment to deliver Britain’s low carbon future

The World Bank and the European Investment Bank are the major issuers of green bonds, with additional issuance in the US and some specific asset backed bonds. The broad characteristics of these bonds are shown in the table above. They have generally been targeted at retail investors and some have complex tax structures. However, despite the concerns mentioned about liquidity and collateral value, these bonds are an emerging instrument with promise if properly structured and marketed.40

If green bonds were to finance all the investment needed to support the low carbon transition over the next five years (£265 million, according to E3G), pension funds and insurance companies would have to allocate up to 5% of their total bond investment (1.7% overall assets) to them. In 2015, this would lead to average pension fund and insurance companies owning £265 billion of assets in this sector or almost 10% of their total assets (Table 2 above).41

For a green bond market to flourish, all participants need to be able to make a return. Simply labelling a bond as “green” is unlikely to spread its appeal beyond socially responsible investment and ethical funds. For comparison, between 2003 and 2009, UK pension funds increased their bond holdings by 9% and reduced their equity holdings by 14%.42 An asset allocation shift from equities to bonds alters risk profile more significantly than a shift within a financial sector (like bonds). Hence an allocation of 25% to a different sort of bond is not as risky as it seems, especially if some of these green bonds come with an AAA rating (sourced from a guarantee). Any change will take time and this target will need to be supported by well structured bonds that address the liquidity and collateral issues discussed above.

Characteristics and structure of green bonds

For a green bond market to flourish, all participants (issuers, brokers and investors) need to be able to make a return. Simply labelling a bond as “green” is unlikely to spread its appeal beyond socially responsible investment and ethical funds. If a flourishing green bond market is to be created, a long-term plan that targets all sectors of the bond market from government to high yield and based on the “need to finance” in conjunction with “need to invest” is crucial.

The conventional markets have grown up the way they are for good reason. They are generally liquid and well priced. A green bond market should therefore broadly reflect the existing bond market so that investors can feel immediately comfortable investing in these important assets. Clearly there will be differences, but it is important to stress the similarities.

---

Table 1: Some Existing Green Bonds40

<table>
<thead>
<tr>
<th></th>
<th>World Bank</th>
<th>EIB</th>
<th>Breeze</th>
<th>CREB (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>AAA</td>
<td>AAA</td>
<td>BB-CCC</td>
<td>AAA-BBB</td>
</tr>
<tr>
<td>Currencies</td>
<td>Many</td>
<td>EUR</td>
<td>EUR</td>
<td>USD</td>
</tr>
<tr>
<td>Amount outstanding (£)</td>
<td>700m</td>
<td>750m</td>
<td>800m</td>
<td>1,500m</td>
</tr>
<tr>
<td>Return</td>
<td>Fixed</td>
<td>Fixed and equity linked</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Use of funds</td>
<td>Broad adaptation and mitigation projects</td>
<td>Renewable energy and efficiency projects</td>
<td>Wind turbine projects</td>
<td>Renewable energy projects</td>
</tr>
</tbody>
</table>

Table 2: Allocation to Green bonds in Pension Funds and Insurance Companies41

<table>
<thead>
<tr>
<th></th>
<th>Annual allocation as a percentage of assets (per year)</th>
<th>Annual allocation (per year)</th>
<th>Allocation by 2015</th>
<th>Allocation as a percentage of assets by 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>1.7%</td>
<td>£53 billion</td>
<td>£265 billion</td>
<td>8.8%</td>
</tr>
<tr>
<td>Bond assets</td>
<td>5.3%</td>
<td>£53 billion</td>
<td>£265 billion</td>
<td>26.5%</td>
</tr>
</tbody>
</table>

40 Veys, A, 2010, The Sterling Bonds Markets and Low Carbon or Green Bonds; E3G
41 Veys, A, 2010, The Sterling Bonds Markets and Low Carbon or Green Bonds; E3G
Instruments that have too many “bells and whistles” will generally not be liquid or well priced. Indeed, all bonds need to have a natural market to be sold successfully and any final solution must be able to adapt to fill gaps created by new regulation (such as the European Alternative Investment Fund Managers Directive) on how and where investors can invest.

Finally, we note that many of the Green Investment Bank’s investments will take several years to produce a cashflow. In the interim, there may be a need for the Bank to cover, via its other funding sources, principle (if any) and interest payments on green bonds, through the “J curve” period.

Green ISAs
Though institutional investors will provide the majority of funds, retail clients do provide an alternative source of funding. A number of proposals have been put forward to harness retail savings for green projects

So far the Government has not given tax credits directly to bondholders as the US Government has done. In the case of Clean Energy Renewable Bonds, the federal government pays interest directly in the form of a tax credit to bondholders. In the case of Build America Bonds, it subsidises payments the issuers make to investors. In the UK, there is not a developed market among tax paying investors in bonds, which is the foundation of the US municipal bond market, (UK pension funds typically pay no tax and insurance companies pay less than 15%). The Economic Secretary to the Treasury recently told the Financial Times that they had asked officials to examine the idea of National Savings & Investments offering bonds to attract retail investors to low carbon energy production. The obvious way to do this would be through a green ISA, but it would require hypothecation to the Green Investment Bank not the Consolidated Fund.

Current ISA structure
ISAs were introduced on 6th April 1999. They are the primary vehicle for tax-advantaged saving outside pensions. Over 18 million people – around one in three adults – now have an ISA. More than £220 billion is estimated to be held in them. From 6th April 2008, the ISA limit was £7,200, up to £3,600 of which could be held in cash with one provider. The remainder could be invested in stocks and shares with either the same or another provider.

43 Details of the green ISA includes ideas and data from Emma Howard Boyd, Jupiter Asset Management
From 6th April 2010, ISA limits for every adult rose to £10,200, up to £5,100 of which can be saved in cash. This gives over 18 million people the opportunity to increase their tax-advantaged savings and directly benefits over five million individuals who make full use of their cash limit or their overall investment limit. The stocks and shares component of an ISA can include:

- Shares and corporate bonds issued by companies listed on a recognised stock exchange anywhere in the world.
- Gilt edged securities (giltis), similar securities issued by governments of other countries in the European Economic Area and “strips” of all these securities.
- Units or shares in UK authorised unit trusts or open-ended investment companies (OEICS) which invest in shares and securities (called securities schemes and warrant schemes) and fund of funds schemes which invest in them.
- Shares and securities in approved investment trusts (except property investment trusts).
- Units or shares in undertakings for collective investment in transferable securities (UCITS) funds based elsewhere in the European Union (these are similar to the UK authorised unit trusts and OEICS listed above).
- Any shares which have been transferred from a Revenue & Customs approved all-employee scheme under the special rules.
- Since 5th April 2005, life insurance policies that would previously have qualified for the separate life insurance ISA component.
- Since 5th April 2005, stakeholder medium-term products.

The estimated cost to the Treasury of raising the ISA limits is £60 million in 2011-12, a comparatively low cost way of offering an additional boost to savers.44

**Proposed green/low carbon ISA structure**

Future tax-free savings limit increases could be exclusively reserved for green/low carbon ISAs. Collective investment funds such as unit trusts and OEICS are available in over a dozen of the investment sectors classified by the Investment Management Association. Also, exchange traded funds (ETFs) are available to track some green/low carbon indexes. For example, there are ETFs for clean energy companies, water-related businesses and large companies with low carbon emissions compared with others in their industry sector. In addition, earlier this year HSBC launched an innovative Vaccine Investment ISA, made possible by changes to the regulations allowing institutions that receive contributions for international humanitarian development projects to issue bonds and other securities that can now be held within an ISA.46

**Green ISAs will be only a small part of the solution. But they will be a visible and symbolic way for retail investors to make a contribution to the Green Investment Bank**

A green ISA could take many forms, but it must fill any gaps created by the introduction of the Retail Distribution Review, which will alter the dynamics of the independent financial adviser market and may create an opportunity to target retail customers affected by this change. Indeed, several different types of policy instruments currently being proposed – green bonds, carbon bonds or climate bonds – but in essence they are all providing ways of using the structure of government and private sector debt in order to stimulate additional investment in low carbon technologies and infrastructure. These structures need to create a clear link between the ISA and the green investments available for use of proceeds (often illiquid assets).

Based on Treasury figures, it is reasonable to assume that a £3,000 increase in the tax-free saving limit would cost less than £50 million, and that a £5,000 increase in the tax-free saving limit would cost less than £70 million. Many ISA providers give individuals the option to contribute on a monthly basis, so it is advisable that the size of increase in the tax-free saving limit is easily divisible by 12 to minimise administrative costs.

Green ISAs will be only a small part of the solution. But they will be a visible and symbolic way for retail investors to make a contribution to the funding of the Green Investment Bank. Over the last decade the average annual value of ISA issuance has been about £30 billion.46 The average cash component (as opposed to share component) has been around £19 billion per annum. Over time, it might be possible to capture, say, 10-20% of the cash component of the annual amount of ISAs raised, ie at 10% this is £2 billion per annum into green investments. But given that most ISA investors are higher rate taxpayers and policy is directed towards winding down tax breaks like pension relief for this group, a fine judgement would need to be made about the potential loss of tax revenue balanced against the wider benefits of harnessing savings in this way. An alternative would be to make a proportion of existing and already announced allocations eligible only for green ISAs.

---

45 http://www.hsbc.co.uk/1/2/vaccine
46 HM Treasury
Green Investment Bank debt fund
In a similar way to the principle of green bonds, institutional investor appetite can be tapped through development of a fund to invest in UK renewable energy and energy efficiency projects on market based pricing and terms. Institutional money would co-invest with that of the Green Investment Bank. This may be focused specifically on particular sized projects (or asset types), such as wind or biomass projects of less than £10 million, where the market is not focused for reasons of scale and others, but will necessarily provide a long-term investment opportunity for institutions (eg the Marguerite Fund). More broadly, a debt fund could provide the GIB with debt capital to deploy for any component part of a wider debt product offering, though in all cases led by the private sector or indeed investing in private sector funds.

The banking sector and/or state owned banks could become equity holders of the Green Investment Bank. We believe this would align interests, create collaboration and risk sharing.

Levy on energy bills
A levy could be imposed on energy bills to fund the Green Investment Bank directly. For example, as an alternative to the current CERT supplier obligation, which is paid through energy bills and costs on average £35 per household, there is a good case for the implementation of a specific levy attached to the network element of energy bills. As CERT is phased out in 2012-13, the money it raises could be replaced by a charge set at a similar level to part fund the activities of the GIB.

Proposals by the Energy Saving Trust and Policy Exchange suggest that the levy could be raised against bills for a guaranteed term and used to finance investment.47 By providing a guaranteed revenue stream, perhaps ten years plus a ten-year run off period, the levy could, by securitising these future receipts, provide a substantial upfront pulse of additional funding for investment.

Initial capitalisation and funding

Private sector and state owned bank capitalisation
The banking sector and/or state owned banks could become equity holders of the Green Investment Bank. We believe this would align interests, create collaboration and risk sharing. One option could see banks forced to subscribe to equity in the GIB through part of the bonus tax (which raised £2 billion in 2009), with equity initially being non dividend paying. Alternatively, state owned banks only could be forced to become shareholders. Alignment of interests in terms of equity shareholding has proven successful in similar projects in the past (eg 3i). Finally, banks could indirectly contribute to the GIB equity base through the use of the Government’s bank bonus levy.

Emissions trading auction revenues
The auction of pollution permits under phase three of the EU ETS will raise, according the Committee on Climate Change, approximately £40 billion for the UK between 2012 and 2020.48 The estimates of the total revenues from the electricity power sector alone in Western Europe are in the region of €13 billion a year.49 Consequently, the UK’s share could meet the funding needs of the Green Investment Bank, as argued in James Cameron’s op-ed piece in The Times, April 2010.50

Sale of Government owned assets
The proceeds from the sale of Government owned assets could be used to provide capital for the GIB. Previously identified assets that could be sold include, the student loan book, the Tote, Dartford Crossing, High Speed 1, airport landing slots, and parts of the radio spectrum.

47 Caldecott, B & Sweetman, T, 2009, Warm homes: Delivering energy efficiency improvements in the UK. Policy Exchange
48 Committee on Climate Change, 2008, Building a low-carbon economy – the UK’s contribution to tackling climate change, p390
49 Karmali, A, quoted in the New York Times, “Don’t think that Cap and Trade is over”, 11th April 2010
50 Cameron, J, “Use polluters’ cash to create a green bank”, The Times, April 2010, http://www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article7092422.ece
6 Deployment and products

The Green Investment Bank should offer a number of quite different services in order to provide a “go to” public sector backed repository of knowledge, expertise and financing capability under the one organisation. This is not to under-estimate the different expertise involved, say, in evaluating the technological risk of early stage venture capital investments and the financing of huge long-term infrastructure projects. The following schema sets out how these activities might be grouped together in one organisation:

Figure 5: Green investment structure

Green Investment Bank

established independently of HMG in the public interest; surpluses re-invested; common branding; focussed strategy; independent governance; prevent crowding out

Banking Division

Mission: Catalyzing private sector investment to enable Britain’s low carbon transition

Activities: Identifying market failures that limit private investment in the low carbon economy; De-risking and enabling project finance (e.g. first of a kind offshore wind projects); enabling access to capital markets by aggregating discrete opportunities for a “green bond” issuance, e.g. for offshore wind and energy efficiency; providing risk reduction mechanisms; investing at commercial rates with profits reinvested; advising HMG on policy appraisal; supporting the scaling up of low carbon technologies.

Potential sources of funding:

- Private Sector and state-owned bank capitalisation
- UK’s EU ETS auction revenue (~£40 billion by 2020)
- Green ISAs (1-5% of total cash ISAs is ~£280 million - ~£1.4 billion pa)
- Levy on energy bills, e.g. CERT replacement (~£875 million pa)
- Green bonds
- Proceeds from the sale of Government owned assets
The following table sets out the characteristics of the different services which the Green Investment Bank would offer:

Table 3: GIB product offering

<table>
<thead>
<tr>
<th>Categories of “product”</th>
<th>Description</th>
</tr>
</thead>
</table>
| Early stage grant funding (ie pre-commercial propositions) | **•** The level of grant funding made available in future will clearly need to be the product of Treasury spending decisions, but the GIB should aggregate the grant payments that are made to a range of quangos at present to ensure consistency, efficiency of distribution and returns.  

**•** The Government currently spends around £400 million pa on low carbon innovation, but a lack of commercial focus means this investment is not delivering its potential. By channelling most of this funding through commercially structured instruments (rather than non-repayable and poorly focused grants) the UK could achieve double or treble the private sector leverage, while doubling the pace of development.51 This would allow the UK to close the £1 billion funding gap with other developed countries,52 reduce the cost of reaching carbon reduction targets by £40-50 billion (roughly 25% by 2050),53 and open up high growth opportunities to business without significantly increasing the public sector commitment.  

51 This is estimated based on Carbon Trust experience, as well as the experience of similar organisations in other developed countries such as Sustainable Development Technology Canada and Cleantech Australia  

52 The £1 billion funding gap figure is estimated from three sources of data: a) NEF data on relative UK funding for cleantech VC shows that the UK would need to grow by 50-100% to reach per capita par with countries like US and Canada (and even Spain and China by measures including PE-expansion funding). This implies an absolute growth potential of ~£500 million; b) IEA data on energy RD&D suggests the UK would need to expand by 2.5-4.5 times to reach par with most other developed countries. This implies an absolute growth of about £500-900 million. Adding NEF’s private sector gap with about 50-75% of IEA’s public sector gap (since not all energy RD&D will go to low carbon) gives you about a £1 billion overall gap; c) Independently, UKERC estimated the potential return to accelerated RD&D to the UK economy (in terms of lowering abatement costs) and calculated that this justified ~£1 billion in additional UK investment in RD&D (without indicating a public/private mix)  

53 This is an estimate from UKERC’s 2050 energy model which looks at the relative welfare costs and energy costs to the UK of reaching abatement targets with “typical” versus “accelerated” technology development. The difference between “typical” and “accelerated” was estimated in detail through an expert-led study of each technology type (not just wishful thinking!). The £30-40 billion represents welfare costs, which include both the tangible GDP-equivalent energy system costs, as well as the unmeasured (but politically very real) costs to people’s welfare of having to limit their energy demand. The 25% reduction is the expected reduction in the price of carbon in 2050, and represents a tangible economic gain  

| Pari-passu equity co-investment | **•** The large-scale, technically challenging nature of some low carbon technologies means that the bulk of projects will, under the current structure of the industry, be managed and led by the ten large cap utilities that already invest in the UK.  

**•** However, income-focused, risk-averse investors, who dominate the ownership of the utilities, will have limited appetite to enlarge the capital base.  

**•** A pari-passu equity co-investment is widely used in contexts where the availability of private capital is limited, allowing “passive” funds to piggy-back the capital discipline of the lead equity investor. This approach is used, for example, by multilateral agencies in emerging markets and mimics the financial purpose of utility joint venturing that is currently widespread in UK low-carbon generation.  

**•** The relevant, co-investing arm of the GIB co-invests equity pari-passu alongside private capital (eg the utilities), buying shares in qualifying low carbon generation projects (or other essential energy projects) at the start of their development.  

**•** The shares that the GIB purchases in each project should be transferable (as far as possible given typical shareholder and lender limitations). The GIB may offer shares that it acquires for sale to third parties at any time and may even find third party buyers of some shares at the project inception, allowing the GIB to save some of its capital for investment elsewhere. By the time of construction completion, we are confident of widespread demand for the shares from third parties – especially from the trade investor (utility) in the relevant project, for which a buy-in of the GIB’s shares in a completed project is earnings accretive. This allows the GIB to sell its shares in a producing project and recycle its capital into new development projects. Alternatively, the GIB may hold the shares and benefit from dividend flow.  

Please see Product drill down 2 for illustration.  

**Note that a similar structure can also be set up with other private sector investors.**
<table>
<thead>
<tr>
<th><strong>Categories of “product”</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loan facilitation and structured finance based on “off-take” agreements</strong></td>
</tr>
<tr>
<td>- The banking crisis has resulted in the virtual elimination of loan syndication markets for large investment projects. Although bank balance sheets are some way to being repaired, it is nearly impossible to raise the large amounts of capital needed for green infrastructure like offshore wind. If the GIB could either purchase and securitise project finance loans or find mechanisms for credit enhancement of publicly traded bonds, it would free up capital that is not flowing to the sector. Such an intervention by the GIB should, however, be temporary, recognising that the syndication markets for long-dated, relatively low risk, green infrastructure debt could return.</td>
</tr>
<tr>
<td>- Providing a secondary market in commercial banks’ project finance renewable energy/energy efficiency loans would provide liquidity to commercial banks and enable them to free up capital to lend to more projects. It should create a distribution mechanism from commercial banks’ balance sheets to the debt capital markets.</td>
</tr>
<tr>
<td><strong>Debt provision through partnerships with private sector</strong></td>
</tr>
<tr>
<td>- GIB can partner with private sector banks to provide liquidity and financing where specific blockages exist</td>
</tr>
<tr>
<td>- Though the principle of partnerships with private sector banks to improve liquidity applies more broadly, a good example lies with energy efficiency for SMEs, where we believe the GIB can play a role in unlocking the estimated £1 billion per annum energy saving opportunity for SMEs by providing financing to its private sector partners for such projects. Please see product drill down 3 for illustration.</td>
</tr>
<tr>
<td>- A similar example exists for residential households, where the GIB can play a role providing upfront capital to householders, to be repaid as loans (and in some cases subsidies to householders to complement these loans – on the basis of ability to pay).</td>
</tr>
<tr>
<td>- In both examples the GIB role will need to be part of a consistent Government policy drive.</td>
</tr>
<tr>
<td><strong>Intermediate/mezzanine funding</strong></td>
</tr>
<tr>
<td>- As discussed above, working through partnerships with private sector banks, the GIB may be able to tackle cases of technologies, which are proven but lack the extensive track record of onshore and offshore wind. They may be able to secure workable levels of project finance debt but not at gearing levels sufficient to provide equity investors with the necessary rate of return. In many such cases, the gap may be filled with “intermediate or mezzanine” debt or quasi-equity capital, subordinated to the principal senior bank or bond debt but ranking higher than equity. It earns a higher return than senior debt but lower than equity because it has a lower risk profile. If the project or company performs as expected then actual equity returns will be higher. This additional leverage can make the difference between acceptable and unacceptable returns to private sector capital.</td>
</tr>
<tr>
<td><strong>Risk management – long-term carbon underwrite/floor price for carbon</strong></td>
</tr>
<tr>
<td>- Although the Kyoto Protocol’s first commitment period ends in 2012, EU policy provides a more secure framework for a carbon price until 2020 via the third phase of the EU Emissions Trading System (EU ETS). Arguably the framework extends even beyond 2020 given that there is no sunset clause to shut down the EU ETS. However, long-term investors in low-carbon energy assets (where asset lifetimes are sometimes 40 years) face several challenges.</td>
</tr>
<tr>
<td>- The first challenge is that the forward curve for carbon has limited price visibility beyond 2014. Liquidity in exchange-traded contracts for emissions futures and options drops off four years beyond the present year’s contract (ie, the December 2010 EU allowance) because power generators have little appetite to hedge their future electricity sales or fuel purchases (and thus carbon exposure) more than four years forward. Because of the low liquidity over exchanges for long-dated contracts, power generators typically undertake cross-commodity hedging over-the-counter (OTC) via financial intermediaries. As an example, ten-year repo transactions for EU allowances (EUAs) are being undertaken OTC to help finance carbon efficiency improvements at older power plants. For the proposed products of the GIB that relate to long-term carbon pricing, it will therefore be critical that this risk management avenue (OTC carbon derivative trading) be preserved despite the ongoing EU financial services reform effort that is expected to restrict OTC derivative activities.</td>
</tr>
<tr>
<td>- The second challenge for investors is that the EUA price may insufficiently incentivise investments in long-term clean energy assets in the UK thereby locking in high-carbon assets. Given the UK’s limited ability to influence EUA pricing (beyond advocating deeper EU-wide emission reduction cuts), there is a case for the GIB to provide a risk-reduction mechanism to projects and companies by underwriting a higher and long-term carbon price beyond 2020. The Coalition manifesto has already stated a commitment to a UK-specific price floor for carbon (external to the EU ETS). The GIB could help manage these risks on a project by project basis.</td>
</tr>
</tbody>
</table>

**Deployment and products • 27**
The two examples below illustrate how pre-commercial investment can be more effective in practice. Together they would invest £200-300 million of public funds over five years to leverage up to £1 billion of private investment. Both have been proven by the Carbon Trust, and could be scaled up rapidly. The principles underlying these approaches could also be developed and applied to other areas of current R&D funding.

**Technology Development Accelerators**

The accelerator mechanism creates new companies to commercialise world class UK science. It identifies areas of low carbon technology in which the UK excels. It then focuses on those outcomes where the business really needs to succeed and offers the potential to recover some of the capital employed and in some cases to generate returns for the public money invested. The companies are created by running a public competition to propose the best solution for a new low carbon technology. Once the best team has been selected, a commercial structure is designed to maximise its chances of success. The company is then capitalised through tranched investments of £5-10 million of public funding over approximately five years, with private sector investors participating in later rounds. If the company is successful, returns are realised through sale to the private sector, which is then able to provide the remaining capital to take the new technology to market. Accelerator companies

---

54 Based on a submission to the Commission by Dieter Helm
55 Supporting evidence and details provided by Carbon Trust
require world-class technology propositions to be successful. This limits the potential portfolio to those areas where the UK science base is truly distinctive. Carbon Trust analysis suggests that 20 such companies could be created in the next five years. They would require net funding of £3-5 million in the first year, rising to £15 million pa in the later years.56 Five initial technology areas for investments are evident where the UK capabilities are sufficiently strong: organic solar cells, waste-derived biofuels, low cost plastic fuel cells, automotive and renewables power electronics, and magnesium ion and lithium air batteries. Further opportunities would be identified over the following four years to deliver a portfolio of around 20 companies. The total public investment cost to deliver such a portfolio with conventional grants would be about £250 million. The focus on business outcomes provided by the accelerator mechanism would reduce the investment required to £150-200 million,57 and also generate ~£100 million58 from investment returns from successful companies, reducing the net cost over time to only ~£50-100m, while also leveraging 1-2 times59 private investment.

Pre-Commercial Venture Capital and R&D

Early stage, clean energy venture capital (VC) is severely limited in the UK due to its higher risks, longer payback and lower expected returns than other investments. In this sector, mainstream VC managers have tended to concentrate on later stage companies which offer more immediate and certain returns for their funds. The combination of the relative lack of UK investment in this area60 and the UK’s intrinsic competitive advantages (in research and engineering skills, equity and capital market access) suggest that there is a significant unrealised potential. A specialist fund could provide lead funding and in-depth technology (and in rare cases consider market due diligence) to stimulate private sector investment. Crucial to success, it must have the expertise to provide technical and commercial assurance for private sector co-investors. The fund would target companies in sectors where the UK has competitive advantages, like energy efficiency; smart grid networks; micro generation and renewable energy. An “evergreen”, self-sustaining early stage venture capital fund seeded with £50-100 million61 could initially invest in around 20 high potential, early stage clean energy businesses over a four-year period,62 and plough back profits into new investments. Through the fund taking a proactive lead role, individual investments into companies could be leveraged by an average of 5-7 times63 with private investment thereby injecting up to £700 million into high potential businesses.

Funding the remaining venture capital gap

Taking the idea of funding the venture capital gap one step further, an additional solution would involve the Green Investment Bank offering facilities to match capital invested by qualified, experienced investors. VC backed companies, whether start-ups or later stage, are typically funded by syndicates of VC investors rather than by a single VC investor. With the recent decline in VC fundraising arising from the credit crisis, assembling such syndicates is taking longer and is at times failing. A facility that simply offered to match, say, 10-20% of the capital invested in such companies by qualified, experienced, investors would have multiple benefits, including:

- Increasing the amount of venture capital available in the market (along the lines of what is currently being done through the Innovation Investment Fund). This could stimulate VC funding of early stage, clean or green technology ventures through a multiplier effect, very much as the German and Irish Governments have been doing successfully.

---

56 The portfolio investment forecast assumes that each accelerator will require ~£7.5 million of direct public investment (the median of the current investment range of £5-10 million) and £500k of portfolio costs to run the competitions, select the best teams, set up the company and carry out the necessary market and carbon analysis. If two new accelerators are created each year for nine years, at least two of the existing Carbon Trust accelerators are included and exits are achieved after five years on average, then the steady state portfolio investment requirement will be ~£15 million.

57 The accelerator mechanism provides both a mandate and motivation to ensure the programme of work is pared down to its absolute essentials. The use of the equity investment mechanism also encourages the development team to be as cost effective as possible: the more investment is required, the more they are diluted. Experience with accelerators to date has shown a reduction investment cost by between 20 and 40% compared to cost of the work if a conventional grant funding process were to be used.

58 Investment returns from accelerators are difficult to predict and will be highly variable. By definition, these investments are not attractive to the private sector, and it is expected that the portfolio may overall make a return, although individual investments may be profitable. The figure of £100 million therefore represents a conservative estimate of the cash returned from exits on the basis that half of the portfolio is completely written off while the average cash out from the ten “successful” companies is £10 million.

59 Experience to date has shown that private sector appetite to participate in the accelerator phase of the development of a new technology company is between one and two times the Carbon Trust investment, although this is weighted towards the end of the five-year period. The total private sector leverage, including monies invested after the accelerator exit, will be much greater than this.

60 In 2008 VC investment in UK cleantech represented 0.002% of GDP compared to 0.02 % in the US – Source: “Are trends in ‘clean tech venture’ mirror investing trends in the wider venture space?” An Arbor Square summary report for the Carbon Trust, 5th February 2010

61 The size of the fund is variable depending on quality of deal flow. However an investment rate of £20 million per annum in early stage venture is a reasonable target when the UK currently invests c £80-90 million per annum, and there is a need to boost this figure significantly to be on a par with the US. It should also be noted that in the current difficult economic climate the investment levels in early stage cleantech ventures in the UK plummeted to £47 million in 2008 and it is expected that 2009 will show a similar level.

62 For early stage venture a portfolio of this level would be in line with sector norms as disclosed from statistics from industry bodies like the BVCA.

63 The Carbon Trust has invested £26.8 million in early stage UK clean energy businesses and has leveraged £138.9 million of private sector investment. This implies a leverage ratio of five times. Economic conditions are tough at present and the need for support greater and so a leverage figure of five to seven times is deemed realistic.
for many years through the high-tech Gründerfonds and Enterprise Ireland.

- Giving comfort to VC investors that policy changes are unlikely as the GIB is an investor for a commercial rate of return on tax-payers’ money.
- Reducing the time it takes to assemble a venture capital syndicate and making such funding consortiums more likely.

When acting as a VC investor, the Green Investment Bank should be able to “follow” its investments through subsequent investment rounds. In VC, it is not uncommon for new companies to have several rounds of fundraising, with each round...
Product drill down 3: Energy efficiency for SMEs

Rationale and concept
Carbon Trust experience of working with tens of thousands of SMEs demonstrates that they can reduce their energy bills by 10% to 20% by investing in cost-effective energy efficiency measures. However, this opportunity is not being taken up for three reasons: energy is a relatively low cost or low priority for most businesses, financing is not available to SMEs on terms that make uptake attractive and SMEs do not have the necessary technical knowledge and confidence to invest. To address these barriers, we propose a three pronged approach (which is beyond the scope of GIB and represents only a suggestion for consideration of Government):

- Incentivise businesses to invest via a business rate differential on the energy performance of their buildings.
- Offer loan finance at favourable rates for investment in the energy efficiency measures.
- Provide assurance to SMEs around the technology solutions that they implement.

This could result in a reduction of £1 billion per annum from the energy bills of 50,000 SMEs and a decrease in UK carbon emissions of 7 MtCO₂ per annum for £180-£320 million of public funding.

Delivery
Change business rates to drive demand
Current business rates typically make up around 10% of an SME’s cost base, while energy bills are typically only 1%. Introducing a graded variation to business rates, from a significant cut for the most efficient buildings through to a significant increase for the least efficient buildings, would raise a typical SME’s incentive to implement measures by several times the value of the pure energy savings, while ensuring net revenue to councils from business rates remains unchanged. Existing Display Energy Certificates could be used to make this assessment. While this change may take two to three years to implement, setting the process in motion would send a clear signal to the market more broadly which would drive uptake of energy efficiency measures not only in SMEs, but also across larger businesses.

Provide assurance of the technology solution
This is important to de-risk the capital investments for SMEs by giving them independent guidance and assurance over the technology they could implement. This assurance would be provided in two ways. First, equipment suppliers and implementation specialists would be accredited, building on the Carbon Trust’s existing approach of supplier registration. Second, an application review process would be provided, as with the current Carbon Trust scheme, to assure the technical solution. Importantly, one of the conditions of support by the Green Investment Bank would be that designs be made open to others planning to invest (in the same way that the Empire State building was used as an open example in the United States).

Provide low cost finance to enable SME investment in energy efficiency measures
Through partnership with private sector banks and with the support of the Green Investment Bank, the existing successful Carbon Trust SME loan scheme can be rapidly built on to deploy the £1.5 billion in loans over a five-year period required to unlock £1 billion of energy saving potential for 50,000 SMEs. Interest rates currently offered to SMEs for unsecured loans typically exceed 10%, with much of this being driven by the risk of default. In the proposed scheme, partner retail banks would offer loans to SMEs at 6%. This would be achieved by using capital provided by the GIB at gill-plus rates (just over 2%), covering administration and marketing costs of about 1% each, and leaving a 2% margin for the Bank. Funds raised through the Climate Change Levy (CCL), or a future carbon levy, could be used to fund the remaining costs, namely the risk of default of up to 6% and the cost of providing assurance on the technology solutions (see above) and of managing the partner retail banks of 2%. This use of CCL funds would be fully consistent with the stated purpose of the levy, which explicitly includes the support of energy efficiency measures. In total £180 million would be needed to cover these costs over the lifetime of the scheme, equivalent to ~3% of the revenue raised by CCL. A competition would be run

65 Analysis and support provided by the Carbon Trust
66 Based on an extrapolation of Carbon Trust data from its work with SMEs. It is estimated that there are ~50,000 energy efficiency measures requiring capital expenditure of between £3,000 to £100,000 (the range for the current loan scheme), with a payback of four years or less.
67 Business rates are set by a multiplier (~48% for 2009-10) of a property’s rateable value, which is comparable to the rent paid. Rent typically accounts for ~20% of costs for a service business.
68 While high street banks may advertise lower rates, pricing varies widely by loan. Anecdotal evidence from a range of businesses suggests average unsecured loan rates are greater than 10%.
69 Accepting this level of default, higher than that which banks would conventionally accept, is key to enabling the scheme to reach the number of SMEs required to have the target impact.
70 A team of mainly technical staff would be required to provide the supplier accreditation and application check services. In addition, further resources would be required to manage the retail bank partner relationship. At the fully operational loan disbursement rate of £300 million pa, it is estimated that this would equate to a cost of ~£6 million pa (or ~2% of the loans disbursed).
71 Assuming straight-line principal repayment over three years.
72 Climate Change Levy receipts for 2009-10 (estimated) and 2010-11 (projected) – from Budget 2010, the Treasury.
to select a panel of banks to deploy the loans and to market the scheme. The timeline for getting the regulatory backed option fully operational would be dependent on the timeline for the introduction of the business rate adjustments.

Product drill down 4: Energy efficiency for households

As the recent Green Deal recognises, we need to reduce energy demand by improving the energy efficiency of the UK’s housing stock rather than simply decarbonising an ever-increasing energy supply. It is the cheapest way of delivering carbon emission reductions and energy security. Yet despite the supposed short payback times for householders, tangible large-scale investment opportunities are limited. Thus there are very significant barriers to mobilising the investment required in this sector over the next ten years. They are:

- For householders – limited access to and opportunity cost of capital.
- For investors – limited demand for the energy efficiency product and a highly fragmented opportunity with high transaction costs.
- For the energy utilities – supply side decarbonisation capital requirements means there is insufficient capital available to invest on the demand side.

To deliver energy efficiency at scale, these key investment issues will first need to be addressed encouraging greater demand from householders. New policies to increase demand such as widely subsidising energy efficiency measures, offering zero or low interest loans, and ultimately, either implementing penalty rates of stamp duty for houses purchased where the buyer does not implement available energy efficiency measures or setting minimum standards on properties, will be required. But provision of upfront finance to householders and aggregation of the investment opportunity is also required. To be successful, key questions will need to be answered. First, where does the upfront capital for householders come from, and how is it disbursed. Second, how is it paid back?

Note: Funding for domestic energy efficiency is tackled within the existing Green Deal. This proposal suggests that the Green Investment Bank should support this process.

Providing up-front capital – A public/private blended capital programme funded by green bonds raised by the GfB combined with public funds sourced from a new “energy services” wires charge routed to the GIB would be used to provide: upfront capital to householders, to be repaid as loans; subsidies to householders to complement these loans – on the basis of ability to pay; and the administrative processes – including the portfolio manager which would oversee delivery of the scheme.

Figure 7: Potential financial flows for domestic energy efficiency improvements

73 Analysis and support provided by E3G
74 Analysis commissioned by the Committee on Climate Change has indicated that subsidies are likely to be required for the foreseeable future in order to support demand for energy efficiency. This is consistent with experience in Germany (where grants covering up to 17.5% of costs or loans of up to €75,000 at subsidised interest rates are awarded), in France (where 0% interest loans are being offered to households), the Netherlands (also offering grants and loans) and the US (where a variety of subsidy regimes are used)
A portion of the publicly sourced funds would be held by the Green Investment Bank in a “guarantee fund” and would be used to provide security for loans taken out under the pay-as-you-save system. Risk would be managed in the system through coherent policy design, loans being location specific and allocated on the basis of ability to pay; and the guarantee fund. On the back of this financial structure, the energy companies but also new providers – small local contractors or retail companies – could market, sell and install energy efficiency retrofit packages to consumers, making a margin on every package sold without a requirement to find the upfront capital, which would limit who could play in this market.

**Paying back the private capital** – As set out in Figure 7 above, households unable to pay would receive loans with near 100% subsidies, and the able to pay sector near 100% upfront loans as possible to leverage their investment. For loans, the repayment would be secured through a long-term location-specific charge – pay as you save. Repayments would be embedded in the electricity bill/council tax bill and passed on via the energy supplier/local authority to the original investor (the Green Investment Bank) regardless of who lives in the property. Crucially, they should be lower than the energy savings delivered.

Over the very long term, in the event that househoolders are obliged to meet minimum standards, pay-as-you-save schemes and other Government financial involvement may not be needed – instead the market would be likely to come forward with a range of financial products that consumers could use to raise finance, enabling the GIB to step back and the private sector to step forward.

**Product drill down 5: Unlocking scale in offshore wind**

**Rationale and Concept**

The UK is not on track to deliver the necessary scale of investment in offshore wind to meet its renewable energy targets, which require ~30GW of offshore wind by 2020 and an investment of up to £100 billion. Partly this is a function of the lack of capital available to finance construction, which is driven by investors’ perception of the high risks involved (compared to reward) and lack of readily available historic performance data to prove otherwise. To ensure the 2020 targets are met, a number of measures to address other key barriers will also be required. These include ongoing public R&D support of ~£60 million per annum to ensure sufficient scale investment to reduce the overall cost of offshore wind – and the finance gap by ~£20 billion over the decade, improved efficiency and investor confidence in the value of the market mechanism, for example by moving to a fixed feed-in tariff regime; and the provision of sufficient market incentives or penalties to ensure that offshore wind licence holders (mostly utility companies) develop their round-two and three sites at the rate required to meet the renewable energy targets (noting the additional regulatory risk this entails). To further incentivise investment the government could also consider exempting renewables projects from tax on capital gains. One benefit of this measure would be the fact that Government would receive corporation tax, VAT and National Insurance Contributions on profitable projects which might not otherwise have been pursued without the additional incentive. Although, it is important to note that under the State Aid rules, European Commission clearance would be needed before this proposal could be implemented.

The Green Investment Bank could play a significant role in unlocking the private capital required. Over the next decade, new sources of both equity and debt are likely to be needed, in addition to investment by utilities. The Green Investment Bank could co-invest, by providing additional equity or debt. However, the provision of risk reduction products on commercial terms could unlock a greater volume of private sector investment than co-investment, by releasing project finance debt, which would also enable further equity to invest on a more attractive, leveraged basis. In this way, the GIB with a capital base of £100-400 million could help unlock an additional £3 billion of finance (see below).

**Delivery**

Detailed project by project negotiations would be required to determine the most appropriate product or products in each case. By way of example, one or more of the products below could help to unlock scale project finance by reducing the risk to investors to within the more typical range:

- Contractor default letters of credit: A letter of credit which gives confidence to a project that, in the event of a claim against any of the contractors due to a delay or cost overrun, the claim will be honoured with the immediate release of funds. This ensures rapid compensation in the event of contractor default – a typical concern in multi-contractor projects. Payment would be made even if the contractors remained in dispute with each other, or if any were insolvent. It helps to cover the problem of “interface” risk, where claims against contractors fail due to disputes between the different contractors as to responsibility for overruns. To help to unlock project finance markets, this facility could be provided for 20-40% of the total cost of the project.

---

75 Holmes, I & Mabey, N, 2010 Accelerating the Transition to a Low Carbon Economy: The case for a Green Infrastructure Bank, E3G
76 Other key barriers include ones that apply in the construction phase, such as unsustainably high technology costs and insufficient pressure on the industry as a whole to invest at the scale required to meet the 2020 target, as well as barriers in the operation phase such as the risk to revenues of a project from fluctuations in electricity price and the long-term value of renewable support mechanism (the RO) and long-term operating and maintenance costs.
• Extreme events insurance: An insurance policy offered to a project which covers events not typically covered by any constructors’ liability (and therefore not covered by a contractor default letter of credit) but which could cause considerable cost overrun. Example events could be poor weather stopping construction for more than 30 days over a summer build season or unforeseen seabed conditions requiring greater foundation work. To unlock project finance markets, this policy could provide cover for 20-40% total cost overruns.

• Contingent loan facilities: A standby loan facility made available to the project for draw-down in the event of a cost overrun, usually matched by an equity draw-down facility to maintain leverage ratios and ranking equally with (or potentially junior to) the senior debt. It would typically be provided to cover 5-10% of the total senior debt provision.

The Green Investment Bank could potentially syndicate further some of the liabilities among other insurance companies and banks. A charge would be made for the products on commercial terms. To mitigate potential state aid concerns, products could be offered through an open market process. These products should increase overall returns to equity, as the unlocking of leverage at the construction phase could increase equity internal rate of return (IRR) by an additional ~3 percent age points. This could more than compensate for the cost of the products, which would increase the overall cost of the project by perhaps 1-2%, reducing equity IRR by only ~0.5-1%, making the products attractive to both equity and debt providers.77

These products offer attractive ratios of required Green Investment Bank capital compared to the finance unlocked. Each of the contractor default letters of credit and extreme events insurance would unlock 7.5-30 times78 more finance than the estimated capital required, while contingent loan facilities could unlock 10-20 times79 more finance than capital required. Using these ratios, a GIB with a capital base of £100-400 million allocated to offshore wind could help unlock an additional £3 billion of finance, which could be enough to bridge the estimated finance gap for UK offshore wind in 2013. This capital base would need to grow over time – perhaps adding three times that amount of fresh capital in 2016, to unlock closer to £10 billion of additional capital in that year. An example of how the products of the GIB could come together to support offshore wind is shown below:

**Debt component of GIB product offering**

It is clear from a number of representations made to us over recent months that the real market failure has been felt in the debt markets – the continued absence of a bank syndication market of any depth means that banks will not underwrite in the expectation of being able to distribute part of their underwritten position at a later date. Debt also unlocks equity participation in projects through lowering the overall cost of

---

77 Calculation is based on the contractor default letter of credit and extreme events insurance being priced at an effective cost of 50-100bps of total construction value – this would need to be determined by an open market process and would depend on the precise nature and magnitude of risks covered. If both were provided, this could add 1-2% to construction price. This would reduce equity IRR over the lifetime of the project by ~0.5-1 percentage points. However, it would help to unlock leverage of ~60% debt during the construction phase, which would improve equity returns by an estimated 3 percentage points over the whole project (it is assumed the equity is already leveraged with debt post-construction), leaving equity returns overall higher.

78 Unlocking an additional £1 billion of debt involves a total construction value of £1.66 billion (assuming 60% debt), which at 20-40% of construction value could be a maximum draw down value of £0.33-0.66 billion under either contractor default letters of credit or extreme events insurance. This could require capital of 10-20% of maximum draw down – or £0.03-0.13 billion to unlock £1 billion of additional finance. This gives a capital required to finance unlocked ratio of 7.5-30.

79 A contingent facility offered at 5-10% of total subordinated debt could unlock 10-20 times the total capital committed to the facility.
capital and allowing certain projects to exceed target or hurdle rates of return. So for many of those whom we have spoken to, the greatest assistance that the Green Investment Bank can offer is in relation to the provision of debt finance.

The structure by which debt unlocks equity participation can vary, with some arguing that this needs to be on a case-by-case basis to attract investment from, say, insurance annuity funds. For example, in the context of the idea of state-funded investment banks like KfW, insurers’ requirements are not for government guaranteed or AAA rated debt (the rating is desirable but the credit spread would probably be too narrow to support annuity pricing).

The importance of cost of capital to infrastructure projects is now widely understood. Therefore ways in which Government can reduce cost of capital while still retaining private sector disciplines in relation to project management, such as whole life costing, are a key benefit of a creating a state backed development bank. This principle is well established across Europe through organisations such as KfW in Germany, Caisse de Dépots in France, ICO in Spain, Cassa Depositi di Prestiti in Italy and others. But we do not have a similar institution to reduce the cost of capital across the infrastructure sector – we have done it on a project by project basis using a variety of different support mechanisms:

Table 4: Spectrum of past UK Government support for infrastructure debt

<table>
<thead>
<tr>
<th>Explicit guarantees</th>
<th>Govt sourced income streams</th>
<th>Underpinning of senior debt</th>
<th>Implicit but not explicit govt support</th>
<th>Regulatory duty to allow entity to finance itself</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Rail</td>
<td>BBC Broadcasting House</td>
<td>Tubelines &amp; Metronet (note: both went bankrupt)</td>
<td>Transport for London &amp; other local authorities</td>
<td>Regulated utilities/organisations such as:</td>
</tr>
<tr>
<td>London &amp; Continental Railways (High Speed 1) PFI investment</td>
<td>Annington (MoD housing)</td>
<td>FSTA (Air tanker refuellers)</td>
<td>Registered Providers of social housing</td>
<td>Water</td>
</tr>
<tr>
<td>Credit Guarantee Scheme for UK Banks</td>
<td>C-17 Leasing</td>
<td>Woolwich DLR extension</td>
<td>Credit guarantee finance for PFI projects (2003-05)</td>
<td>National Grid etc</td>
</tr>
<tr>
<td></td>
<td>Skynet5 (military satellites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table highlights the five different methods by which the Government could provide support to the debt component of the capital structure of an infrastructure project.

Table 5: Capital structure support

<table>
<thead>
<tr>
<th>Explicit guarantees</th>
<th>Govt sourced income streams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EU state aid rules mean that guarantees need to be applied to the debt itself not the entity</td>
</tr>
<tr>
<td></td>
<td>Best practice is to pay a guarantee fee (in the case of Network Rail, the guarantee fee is 80bp) for the use of the guarantee</td>
</tr>
</tbody>
</table>

| Implicit but not explicit govt support |  |
|---------------------------------------|  |
| It is generally a bad idea to have any ambiguity about what the Government does and does not stand behind |

| Underpinning of senior debt |  |
|----------------------------|  |
| The basic concept is that the Treasury utilises its borrowing advantage to reduce the cost of capital for the non-risky part of the capital structure while still harnessing the benefits of private sector equity discipline on the riskier part of the capital structure. However, the attachment point is key: too high and equity is not properly incentivised to manage the project properly (eg Metronet where there was only 5% equity at risk below a 95% underpinning); too low and the remainder of the senior debt is difficult to structure and price efficiently |

| Govt sourced income streams |  |
|----------------------------|  |
| The Treasury and OGC are, according to the Financial Times, looking at offering long-term public sector contracts to wind farms and green waste companies which would assist in raising capital for these projects. This is potentially powerful but the Government covenant must not be given away too cheaply, as has often occurred in past property transactions. |

| Regulatory duty to allow entity to finance itself |  |
|--------------------------------------------------|  |
| Regulator in effect underpins investment grade ratings for senior debt within regulatory ring fenced assets |
We believe that to function most effectively the Green Investment Bank needs commercial independence and should not be accountable to ministers or to Parliament for individual investment and lending decisions. Consequently, the Bank should not, in our view, be an executive agency or non-departmental public body.

“Off balance sheet” treatment for the GIB is also desirable and can be accomplished through the same mechanisms that will achieve operational independence. However, given the importance of the Government to this enterprise, and the number of competing departmental interests including transport and business as well energy and climate change and the scale of the financial commitments necessary to make a difference, on balance, we believe the Green Investment Bank must come under the aegis of the Treasury in the first instance.

Governance, accountability, reporting and role of ministers

In the context of a body with the power to invest public money and borrow with Government guarantee, it is only right and proper for elected ministers to determine the overarching priorities of the Green Investment Bank. On the other hand, it is essential, for classification reasons that the public sector cannot determine the “general corporate policy” of the GIB and for International Financial Reporting Standards that the Government does not have “significant influence” over it. This would preclude the Government from determining specific projects, businesses or technologies that it wished to see financed, as the board of the Bank must have the power to select the most appropriate projects or technologies. Nevertheless, it is possible, in our view, to devise a structure for the GIB which encompasses both these objectives. It needs a strong governance framework; private sector board directors of stature and independence; and employees with professional expertise.

The way in which we believe this could be achieved is through a three-tier structure as follows:

- An **advisory council** made up of shareholder representatives, who advise on sub-sectors they would like the Bank to focus its efforts on. Ministers or their delegates could be represented on this advisory council, as would a number of individuals representing the public interest, with an environmental or social focus. DECC, DIT, the Treasury and other relevant departments could set out what targets and outputs they wished to see delivered in policy terms and what funding they are prepared to make available. As in the rail industry, where the Office of the Rail Regulator mediates
between what the Government wants by way of outputs, its budgetary constraints and what Network Rail believes it will cost to deliver, there may be a role for Ofgem to play here.

- Below this advisory council, would sit the board of directors with legal responsibility for the commercial operation of the Bank, in accordance with the operating principles. This would include a non-executive chairman, CEO, CFO, CRO and non-executives and be primarily made up of professional financiers, independent commercial business leaders and sector investors. The board would be responsible for approving strategy and could have final say on whether investment proposals are approved. This could be for all proposals or for those above a specified level, with a designated investment committee taking care of the rest.

- The management team, led by the chief executive, would be responsible for day-to-day operations within the strategic framework approved by the board.

"Off balance sheet" treatment for the GIB is also desirable, and can be accomplished through the same mechanisms that will achieve operational independence

The Green Investment Bank should report regularly and transparently in accordance with IFRS like any listed private sector company against its key objectives. As a private sector company, it would be unlikely to be subject to the Freedom of Information Act (FoI) or the requirement to publish each projection in the Official Journal of the European Union (OJEU), although the latter is less clear since utilities, for example, may comply with the OJEU. This is not to suggest, however, that the GIB should be anything other than fully transparent in its decision making and accountability.

Under the arm of an overall holding company, the Green Investment Bank would need to contain a Financial Services Authority regulated bank, which will require a panoply of regulatory and reporting processes to be adhered to, capitalisation requirements, “fit and proper” persons tests etc. Further work is required to establish the FSA/Bank of England requirements and how long would it take.

The Committee on Climate Change could provide an important source of advice and input to the GIB, but as a public body, it would be desirable to avoid any statutory obligation for either the advisory council or the board of directors to consult the committee.

The Office for National Statistics has become increasingly wary about not being involved in “policy formation” (in the same way that accountants may advise). This was exacerbated by the LCR case in 2006. A dialogue with the classification authorities about what might work is possible in some other countries but not in the UK. Consequently, the practicalities of devising a governance structure that meets the above objectives will be challenging. Furthermore, it is practice rather than theory that decides the classification treatment.
Appointments

We have said above that the Government should not control the “general corporate policy” of the Green Investment Bank. This could extend to the appointment of the chairman and the board if care is not exercised. It would be desirable for appointments to voluntarily follow the principles of the Public Appointments Commission, though not being made by ministers.

The board would be responsible for advising on and managing the transition of elements of the Carbon Trust and other quangos to the Bank and for appointing the management team.

Legal form of the GIB

Annex 6 sets out the IFRS accounting and classification issues that must be navigated to ensure that the Green Investment Bank is classified to the private sector and not consolidated within the Whole of Government Accounts (WGA).

The GIB could be a body limited by share capital or limited by guarantee, like Network Rail or the Carbon Trust, in which case it would have members not shareholders and the board would need to be answerable to these members and not to ministers. In either case, a parliamentary Act (mentioned in the Queen’s speech on 25th May) would need to set out its defining principles and mandate based on those described earlier in the document. An approach similar to that used in the Climate Change Act 2008 to establish the Committee on Climate Change is a possibility. The Act would contain powers (as a Secondary Order) to establish a statute for the Bank, defining “the rules of the game” within which the investment team works. The statute could only be amended by majority shareholder vote and will be the key tool to managing the tension between the need to invest in the public interest and the need to have a commercial outlook.

The statute establishing the Green Investment Bank should be broadly drafted and high level, allowing the GIB itself to establish subsidiaries, joint ventures and other commercial activities in accordance with its mandate. The articles of association of these entities would define their activities and remit.

The geographic reach of the GIB beyond the borders of England is of relevance. The presumption is that any institution which contributes finance to projects of interest to Scotland, Wales and Northern Ireland would be welcomed. However, this welcome may be muted if it meant loss of control or influence over these projects or if they had to contribute funding or capital to the establishment of the GIB. Further work is necessary to establish the potential “rules of the game” outside England.
Unlocking investment to deliver Britain's low carbon future
8 Operational set up and implementation plan

SECTION CONCLUSION: The GfB would structure itself to ensure specialist skills are available across all of its functions, with separate teams for banking and the UK Fund for Growth. A strong organisational structure to ensure the mandate of the GfB is upheld will be critical, with talent drawn as far as possible from existing Government entities and combined with private sector expertise.

From an operational standpoint we envisage the Green Investment Bank to have core teams, one focusing on the UK Fund for Growth and equity investments (investment of equity into pre-commercial ventures) and the second for the banking sector (tapping into the capital markets to provide additional liquidity and tackling other market failures).

The team forming the Fund for Green Growth division will be made up of existing personnel from Government entities that are to be consolidated, where a wealth of experience and skills exist. It will include originators in sectors such as energy efficiency, renewable generation projects, transmission and distribution.

The team forming the Banking division will comprise a small set of experienced bankers able to support activity on the secondary markets (purchasing of loans/securitisation markets but distinct from bond/ISA issuance from GfB itself). A small team of loan officers for specific sectors will be needed to manage the distribution of funds (via commercial banks) to ensure that all the criteria set by the GfB are maintained – these may also be sourced from existing quangos or may be hired/seconded from the banking sector.

By working in collaboration with the market to source and manage deals the personnel requirement for the GfB will be limited. Only a core set of senior managers, secondary market bankers and loan officers to oversee that risks and mandates are being maintained will be necessary; many of the skills are already available within existing Government organisations.

Figure 9: Illustrative organisational structure for GfB

Operational set up and implementation plan • 41
Supporting these divisions will be a streamlined operations department (IT, ops, HR), an overall credit risk officer and a CFO. The CFO will manage a team of bankers (max four to five) who will act to issue bonds on the secondary markets (distribution will be outsourced). The general counsel’s office will in addition to normal legal advisory and compliance functions have responsibility for liaising with shareholders and the market and for communicating the GIB’s position on Government policy where appropriate.

The Green Investment Bank needs to become operational in a short and efficient process. Experience in the United States has shown that investor initiatives with similar goals to the GIB can fall foul of the “rule of unintended consequences”: financiers stop investing while they wait for the rules of engagement to become clear.

Finally, the policy unit is the important check and balance to ensure that the GIB adheres to its policy objectives. It will be responsible for translating policy objectives set by the board into specific measures against which the policy impact of the GIB will be assessed. Each transaction proposed by the Banking division and the Venture Fund will be assessed against these measures in the sanctioning process (in parallel to the risk assessment performed by the risk department). In addition, the policy unit will track measures for individual transactions to monitor ex-post attainment of policy objectives.

By working in collaboration with the market to source and manage deals the personnel requirement for the GIB will be limited. Only a core set of senior managers, secondary market bankers and loan officers to oversee that risks and mandates are being maintained will be necessary; many of the skills are already available within existing Government organisations.

Once announced, the Green Investment Bank needs to become operational in a short and efficient process. Experience in the United States has shown that investor initiatives with similar goals to the GIB can fall foul of the “rule of unintended consequences”: financiers stop investing while they wait for the rules of engagement to become clear. In the case of the Green Stimulus Capital in the US, a plan of funds to be spent in 2009 and 2010, for example, New Energy Finance estimates that only 9% of the earmarked funds had been drawn by the end of 2009. Investment in low carbon projects in the US in 2009 was 15% down on the previous year despite newly available capital grants, loan guarantees and other stimuli. A process that leverages existing skills, puts in place a strong board and management teams quickly and has projects prioritised and rolled out in as an efficient a manner as possible will be critical if the GIB is to succeed.
Annexes

Annex 1: Size and nature of decarbonising UK electricity and heat from 2010 until 2030

Decarbonising UK Electricity Generation

Source: National Grid

Decarbonising UK Heat

Source: National Grid
Annex 2: UK Generation sector funding requirement to 2020 – meeting the target

Selected utility capex in 2009: EUR bn

<table>
<thead>
<tr>
<th>Utility</th>
<th>Non RES capex</th>
<th>Other RES</th>
<th>2009 Offshore wind spend</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.On</td>
<td>9.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RWE Innogy</td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scottish Power Renewables</td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vattenfall</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EnBW</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dong</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrica Energy</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSE</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total capex in 2009 = EUR 35bn

Note: Non RES capex includes conventional power generation, transmission and distribution where applicable
Source: Companies, Bloomberg New Energy Finance

Utility capex 2009-12: EUR bn

<table>
<thead>
<tr>
<th>Year</th>
<th>Eon</th>
<th>RWE Innogy</th>
<th>ScottishPower</th>
<th>Vattenfall</th>
<th>EnBW</th>
<th>Dong</th>
<th>Centrica</th>
<th>SSE</th>
<th>Offshore wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>34.6</td>
<td>36.1</td>
<td>33.3</td>
<td>31.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Cost benchmarks of EUR 3m/MW used
Source: Companies, Bloomberg New Energy Finance

2010-2020 utility funding shortfall: EUR bn

<table>
<thead>
<tr>
<th>Year</th>
<th>Funding shortfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-2020</td>
<td>69.0</td>
</tr>
<tr>
<td>Utility spend to 2020 (avg of 2009-12)</td>
<td>34.4</td>
</tr>
<tr>
<td>Estimated total pool of debt capital in 2010 = EUR 1.8bn</td>
<td></td>
</tr>
</tbody>
</table>

Note: Using cost benchmarks of EUR 3m/MW and assuming an average of EUR 4.5bn spent per annum across the next decade
Source: Bloomberg New Energy Finance

Estimated total pool of debt capital in 2010 = EUR 1.8bn

<table>
<thead>
<tr>
<th>Source: Bloomberg New Energy Finance</th>
<th>EIB</th>
<th>Commercial</th>
<th>ECAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated total pool of realised debt capital = EUR 1.8bn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Estimated from interviews and disclosed deals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECA – export credit agencies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bloomberg New Energy Finance

44 • Unlocking investment to deliver Britain’s low carbon future
Annex 3: Types of low carbon investment

Broadly speaking, low carbon investments fall into four broad categories:

1. New and innovative technologies, such as wave and tidal power and advanced biofuels. These investments involve substantial technological, business and market risks and investors accordingly seek high returns. These investments rarely support bank debt.

2. Expansion and scale-up of proven technologies and supporting services, such as anaerobic digestion, offshore wind and its support infrastructure. These investments involve lower technology risk, but need long-term capital for growth to reach economies of scale. They can generally attract some bank debt. Investors seek medium level returns.

3. Infrastructure investments such as on and offshore wind farms, transmission lines, and large scale biomass. These investments have low technical risks, but high capital costs relative to conventional energy. Investors are long term and banks will lend to such projects. Returns are lower, as the risks are less.

4. Consumer, retail and SME investments – primarily energy efficiency investments such as loft insulation, rooftop solar panels and biomass heat. Return expectations for these investments vary. Unlike the first three investments, the challenge is the small size of individual investments.
Annex 4: Inferences to be drawn from institutional asset allocation

Much is made in many quarters of the potential of UK pension funds to finance infrastructure investment by channeling long-term pension savings into infrastructure projects, matching long-term savings with infrastructure investment need. Nonetheless the distinction must be drawn between those funds directed towards equity investment and those to debt. The table below shows how the asset allocation of UK defined benefit pension schemes has changed over the last three years.

The total assets of the 200 largest defined benefit pension schemes in the UK are £498 billion. The “other” figure which includes infrastructure equity (both in UK and overseas) amounts to 4.5% of this figure, which is only £22.5 billion. Only a few of the very largest pension funds have the capability to invest directly given the need to acquire a diversified portfolio of assets and the amount required to buy controlling stakes. This channels the majority of pension funds with a small but growing allocation of assets to infrastructure, to invest indirectly through infrastructure funds. It is therefore not likely, in our view, that these funds will be a significant source of new equity to invest in the Green Investment Bank or alongside the GIB in new infrastructure projects.

Driven by a dramatic shift out of listed equities, as well as a fall in their value, the table shows a significant and growing allocation to gilts and fixed interest. It is therefore clear that to become a significant source of funding for UK infrastructure, it is necessary to tap this gilts and fixed interest asset allocation, particularly since they often do not offer the long-term returns that many investors are seeking. UK pension funds are a more realistic source of debt financing than equity funding.

However, with one possible exception, UK pension funds and insurance companies have not generally invested in the analytical skills necessary to assess construction risk and rarely want to invest until a project is operational and cashflow producing. Arguably, before the credit crunch, the monoline insurance companies arbitraged the capital requirements so that spreads were driven too low to reward skills investment of this nature, but nonetheless it is important to recognise that the appetite for credit investment on a project basis among UK institutions is very limited: demand is there for well structured corporate debt and mature project debt, producing cash yields.

Asset allocation of UK defined benefit pension schemes

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2009</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities (ie listed)</td>
<td>61.1%</td>
<td>46.4%</td>
<td>-14.7%</td>
</tr>
<tr>
<td>Gilts and fixed interest</td>
<td>28.3%</td>
<td>37.1%</td>
<td>+8.8%</td>
</tr>
<tr>
<td>Insurance policies</td>
<td>0.9%</td>
<td>1.4%</td>
<td>+0.5%</td>
</tr>
<tr>
<td>Cash and deposits</td>
<td>2.3%</td>
<td>3.9%</td>
<td>+1.6%</td>
</tr>
<tr>
<td>Property</td>
<td>4.3%</td>
<td>5.2%</td>
<td>+0.9%</td>
</tr>
<tr>
<td>Hedge funds</td>
<td>N/A</td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td>Other (inc infrastructure equity)</td>
<td>3.1%</td>
<td>4.5%</td>
<td>+1.4%</td>
</tr>
</tbody>
</table>

Source: The Pensions Regulator
Annex 5: Green bond overview

World Bank bonds

The World Bank dabbled in late 2007 with euro denominated green bonds targeted at retail investors. The return on the bonds was tied to the performance of an “Eco Index” which was linked to the equity performance of a set of companies defined by ABN Amro. The outstanding amount is about €230 million. It also launched a small bond (about $30 million) that was linked to certified emission certificates (CERs). These were linked to particular projects and again retail targeted.

The first of the major series of World Bank green bonds was issued in November 2008 in conjunction with SEB in Swedish krona to the value of about 3 billion krona (£300m) targeted at both retail and institutional investors. They have continued to issue in the series as shown in Figure 1. The sizes of issuance are typical of World Bank bonds and so far, under this programme, they have issued just over $1 billion. However, since the first issuance of the green bond in November 2007, the World Bank has issued $51 billion of general bonds and none of these in sterling.

Figure 1: World Bank green bond issuance

<table>
<thead>
<tr>
<th>Bond</th>
<th>Coupon</th>
<th>Maturity Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD 300 Million</td>
<td>Floating</td>
<td>2012</td>
</tr>
<tr>
<td>USD 180 Million</td>
<td>2.00%</td>
<td>2013</td>
</tr>
<tr>
<td>SEK 2.85 billion</td>
<td>3.50%</td>
<td>2014</td>
</tr>
<tr>
<td>NZD 150 Million</td>
<td>5.23%</td>
<td>2015</td>
</tr>
<tr>
<td>AUD 150 Million</td>
<td>6.00%</td>
<td>2017</td>
</tr>
<tr>
<td>BRL 40 Million</td>
<td>9.50%</td>
<td>2017</td>
</tr>
<tr>
<td>HUF 2,500 Million</td>
<td>5.50%</td>
<td>2017</td>
</tr>
<tr>
<td>NOK 400 Million</td>
<td>3.75%</td>
<td>2017</td>
</tr>
<tr>
<td>NZD 50 Million</td>
<td>5.63%</td>
<td>2017</td>
</tr>
<tr>
<td>RUB 750 Million</td>
<td>7.50%</td>
<td>2017</td>
</tr>
<tr>
<td>SEK 600 Million</td>
<td>3.25%</td>
<td>2017</td>
</tr>
<tr>
<td>TRY 50 Million</td>
<td>10.00%</td>
<td>2017</td>
</tr>
<tr>
<td>ZAR 100 Million</td>
<td>8.75%</td>
<td>2017</td>
</tr>
<tr>
<td>MXN 200 Million</td>
<td>7.50%</td>
<td>2020</td>
</tr>
<tr>
<td>COP 25 Million</td>
<td>8.00%</td>
<td>2020</td>
</tr>
</tbody>
</table>

Source: The Pensions Regulator

EIB bonds

The European Investment Bank (EIB) has also issued bonds in their Climate Awareness program. To date they have issued two bonds. The first bond, in 2007, was issued in euros to a value of €600 million (£550 million). Its return was linked to the performance of FTSE4Good Environmental Leaders Europe 40 Index.

The second, two tranche bond was more “vanilla”, with either fixed or floating coupons. These were issued in Swedish krona to a value of 2.2 billion krona (£200 million).

US bonds

There have also been issues in dollars (like the Muni bonds already discussed) but also Clean Renewable Energy Bonds (CREB). The Energy Policy Act of 2005 created special tax credit bonds that allowed electric utilities to receive interest free loans for qualifying energy projects. There is a limit to the amount that can be issued which, for 2009, was about $2.2 billion.

Breeze Bonds

The Breeze series of bonds are asset backed bonds. They were issued by a company called CRC Breeze Finance and are secured on a number of wind farms mainly in Germany. There are seven bonds outstanding totalling about €900 million.

The bonds are structured so that the revenues from the wind farms pay interest and capital back on the bonds. This is clearly an important structure as it is using the bonds markets directly, rather than through the banks, to finance renewable energy projects.

The characteristics of the revenue stream fit neatly with the needs of bond investors. The wind that powers the turbines is reasonably consistent year to year. The wind turns the generators which produce electricity and receive a set payment through the German feed-in tariff. These revenues are reasonably consistent, so they fit neatly with the demands of the fixed income bond investor.

---

80 Veys, A, 2010, The Sterling Bonds Markets and Low Carbon or Green Bonds, E3G
84 This is a guaranteed payment to the asset owner of a set price per MWh of electricity generated ie, if the wind blows, a set amount of money also flows
85 This sort of structure would be difficult to create for the UK market because the policy support mechanism – the Renewables Obligation – delivers volatile cashflows, which do not suit the need for a steady income stream to service the coupons
Annex 6: Classification and IFRS accounting considerations relevant to GIB in a UK public sector context

This annex sets out the constraints to securing off-balance sheet treatment in the UK for the Green Investment Bank, based upon Network Rail (NR) and other precedents. NR has many similarities to the GIB because it relies on substantial Government funding; all of its debt is guaranteed by the Government, but its governance arrangements are independent and it is “off balance sheet” for classification purposes both as regards Government accounting and the National Accounts (PSND).

Before considering the National Accounts, however, the position of the GIB with respect to the Whole of Government Accounts needs to be addressed. The National Accounts are based on the European System of Accounts 1995 (ESA 95), whereas the Whole of Government Accounts are based on the Treasury’s Financial Reporting Manual (FReM). The FReM adopts International Financial Reporting Standards (IFRS), with some modifications: it applies to all entities that are prepared on an accruals basis and consolidated within the Whole of Government Accounts, but not to entities that are deemed to be outside of the departmental resource accounting boundary (although it may be influential). The ESA 95 concept is different from the concept of a group under IFRS as it is based on in-year budgetary control rather than strategic control. Such entities that are outside the boundary include:

- Any body classified as a public corporation by the Office for National Statistics (which includes trading funds).
- Trading funds not classified as public corporations.
- Executive non-departmental public bodies (NDPBs) that produce their own financial statements, except where there are good grounds for consolidation as determined by the relevant authority.
- Other public bodies where the department exercises only strategic control, except where there are good grounds for consolidation as determined by the relevant authority.
- Any body classified to the private or the rest of the world sectors by the Office for National Statistics.
- If the GIB is deemed to be within the departmental resource accounting boundary, then it would be necessary to assess its accounting treatment under some or all of the following accounting standards, as modified by the FReM:
  - IAS 27: Consolidated and separate financial statements.
  - IAS 31: Interests in Joint Ventures.
  - SIC 12: Consolidation – Special Purpose Entities.
  - SIC 13: Jointly Controlled Entities – Non-monetary contributions by Venturers.

IAS 28 defines an associate as any entity over which the investor has significant influence. IAS 28 also lists several factors that would demonstrate the existence of significant influence:

- Representation on the board of directors or equivalent governing body of the investee.
- Participation in policy-making processes, including participation in decisions about dividends or other distributions.
- Material transactions between the investor and the investee.
- Interchange of managerial personnel.
- Provision of essential technical information.

Significant influence is defined in IAS 28 as the power to participate in the financial and operating policy decisions of the investee. Hence the investor only needs to have the power to participate, regardless of whether the power is actually exercised in practice. IAS 28 also specifies that the loss (or gain) of significant influence can occur with or without a change in absolute or relative ownership levels. It could occur, for example, when an associate becomes subject to the control of a government, court, administrator or regulator. It could also occur as a result of a contractual agreement.

Under the Financial Reporting Manual of the Treasury, the consolidation principle is that any entity not classified within the departmental resource accounting boundary, as set out above, should not be consolidated into Departmental Resource Accounts. For example, at the time the Strategic Rail Authority was abolished in 2004, this principle meant that NR was no longer being consolidated into DfT’s Resource Accounts although it had earlier been consolidated into the SRAs accounts.

Can the GIB be classified in the same way as Network Rail?

Key determining factors in the NR and other judgments by the ONS:

- The directors of NR have control of NR’s general corporate policy – there are no Government directors. NR was held to be accountable to the board, its members and its regulator but not the Government.
- The Government controls or “step-in” rights that cut in on “significant financial failure” and “fundamental financial failure”, eg a draw on Tranche A (which is a commitment of contingent capital by the DfT to NR) and right to remove the chairman and chief executive, were deemed by the ONS to be outside “general corporate policy” circumstances and therefore irrelevant.
- There were no special factors which enabled any part of the public sector (including the DfT or ORR) to determine “general corporate policy”, although the SRAs involvement in the directors’ incentive plan was subsequently determined sufficient to amend the date of reclassification from public...
to private sector from 16th August 2002 to 1st April 2003.

- Government lending or Government guarantees on funding did not and do not come with Government controls attached.

LCR (2006) – power to control “general corporate policy” was principally contained in the special share granted to the Government. The existence of these rights rather than their actual exercise was held to be crucial.

British Energy (2004) – nine separate powers identified by the ONS in its decision of 24th September 2004 were cited as the reason for classification to the public sector. This came as a surprise to the Government but did not matter much because BE post-restructuring only had £700 million net debt, ie PSND only rose by that amount.

**What are the implications for the accounting and classification of the GIB?**

The Joint Statement of 24th October 2002 by Sir John Bourn (Comptroller & Auditor General) and Len Cook (National Statistician) in relation to NR essentially agreed to disagree for different and legitimate reasons. The Statistics Commission found that this approach and its consequences damaged the standing of both organisations and determined it must never happen again.

The result was the development of a protocol which effectively means that ONS will always ask first what the GAAP accounting treatment is. IFRS is irrelevant in other Eurostat countries but not in the UK. After the NR decision, it is also no longer possible to simply rely on the Government removing itself from “general corporate policy” in order to achieve classification to the private sector and therefore permit non-consolidation into Resource Accounts under the FReM, because “pure IFRS” is the relevant test and the ONS will consider control on this basis, not as adapted by the FReM. IFRS will be adopted by the Government for 2009-10 for the first time and therefore indirectly governs the basis of consolidation of both NR and prospectively, the GIB.

The Whole of Government Accounts project is aiming for a single consolidated Government balance sheet for 2009-10 for the first time, which will be produced according to IFRS as adjusted by the FReM. The current FReM also specifies that some of the adaptations to IFRS in the FReM will be carried into WGA without further modification and that some parts of IFRS will be subject to further adaptation in WGA. One such adaptation applicable to WGA and Departmental Resource Accounts concerns IAS 27: WGA will comprise those bodies that exercise functions of a public nature, based on ONS’s National Accounts classification, although the Comptroller & Auditor General may still disagree with such classifications.

This means there are two areas to consider for the accounting treatment of the GIB – the Departmental Resource Accounts/ WGA and the National Accounts. Under WGA, an alternative net debt figure to PSNB for National Accounts purposes will be available. Key differences include unfunded public sector pension liabilities, single use military equipment and NR. The relevance of this is that it would be of limited benefit if the GIB achieves off-balance sheet treatment in National Accounts but not in the DECC/Treasury Resource Accounts and therefore in the WGA definition of net borrowing. If the GIB became responsible for more significant differences in net borrowing than already exist because of the size of its balance sheet, this would undermine confidence in the solution found. However it is difficult to envisage a company that contains banking operations being permitted to operate with net liabilities. As a result the PSNB/National Accounts classification should never become an issue.

In order to be reasonably confident that it is not within WGA, the Green Investment Bank would need to be accounted for as an off-balance sheet entity in the light of the IFRS listed above. It is particularly difficult in IFRS to avoid consolidation on the basis of the investor not exercising a significant influence. For example, it would not be necessary for the Government to exercise its power if the GIB always happened to do what the Government wanted by accident or by design, or to enable it to continue to receive core funding, but the Government would have the power if needed. If the Government elected to be passive, significant influence would still exist as long as it had the power to participate in the financial and operating policy decisions when it so wished. There are several indicators of significant influence that are worth considering further:

- Voting power.
- Demonstrating the existence of significant influence.
- Representation on the board.
- Participation in the policy making process.
- Material transactions between investor and investee.
- Interchange of managerial personnel.
- Essential technical information.

Any one of these indicators could be evidence of the existence of significant influence; it is not necessary for all of them to apply. In practice, the best evidence of Government having significant influence would be if it exercised such influence. However, it is having the power to be able to participate in the policy decisions that matters not the actual exercise of that power. Government may be on the board of the GIB, but elect to be passive by not actively participating at meetings or abstaining from voting (although in practice this might be difficult to demonstrate). It is the power that comes with this board representation that matters not the fact that the Government is not participating in the policy-making process.

A distinction is drawn above regarding elected ministers determining “the overarching priorities” of the GIB, but not determin-
ing the “general corporate policy” of the GIB. These terms would require further definition so a view on the accounting treatment under IFRS of the GIB could be taken. Above, we also note that despite the Government’s minority representation on the board, “the ability (of Government) to influence those projects or businesses or technologies that Government wished to see financed (would be precluded)”. This distinction would be important in determining the accounting treatment of the GIB under IFRS.

A practical problem may arise in judging the amount of influence the Government has over the GIB where the investment has only just been made. In these circumstances, the actual relationship usually becomes clear fairly soon after the GIB is set up. However, as stated above, it is the power to exercise significant influence that matters and not the actual exercise of that influence and, therefore, factors such as the number of board members the Government may nominate, agreements establishing the operation of the organisation and the proposed decision-taking process should be used to evaluate the relationship before its record is established. If the actual relationship were to develop differently from that assumed from the arrangements on making the investment, it may be necessary subsequently to change the way in which the investment is accounted if, in practice, Government was not able to exercise significant influence.

Representation on the board of the GIB would normally be essential in demonstrating that Government has the power to participate in the financial and operating policy decisions and therefore have significant influence, unless it is clear that there are other arrangements in place that would give Government the power to participate in policy-making decisions.

An associate relationship will exist if it can be demonstrated that the Government is influential in the direction of the GIB through participation in policy decisions covering aspects of policy relevant to the Government, including decisions on strategic issues. Participation in the policy-making process means being involved in strategic decisions, such as expansion or contraction of the business, participation in other entities, changes in products, markets and activities and determining the balance between dividend and reinvestment. Such participation will be with a view to gaining economic benefits from the entity’s activities.

If Government seconds managerial personnel to the GIB, it may have the power to participate in the financial and operating policies and practices of the GIB to which the personnel are seconded. Government is in a position to select who is sent and can, therefore, provide personnel who will promote its interests or exercise significant influence. Where it can be shown that the interchange of senior managerial personnel has resulted in the Government having significant influence over the management of the GIB, that entity will be an associate.

The structuring as a charity allows for greater ties with Government as core funding is permitted, but this is unlikely to be available to an entity seeking to operate as a bank.
Unlocking investment to deliver Britain’s low carbon future

Report by the Green Investment Bank Commission