

Capitalising the Green Investment Bank

Key issues and next steps

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Ernst & Young LLP

Following the GIB Commission report that recommended immediate priorities, Ernst & Young were approached by Green Alliance, Transform UK and E3G to write about the possible role of GIB and its likely capitalization levels. Ernst & Young, through this independent paper identifies the investment barriers in each low carbon sub-sector and provides suitable products that could be provided or facilitated by GIB. This paper also considers a few structural options for GIB and their advantages and disadvantages for debate and consideration.

Capitalising the Green Investment Bank

In June 2010, Ernst & Young, as a leading and independent advisor, was approached by a group comprising Green Alliance, E3G and Transform UK, to provide an independent view on the possible role of the GIB and its likely capitalisation requirements.

Ernst & Young has been an advisor in the environmental infrastructure sector for a number of years, providing advice to industry stakeholders including Government departments (such as Department of Energy & Climate Change, Office for Gas & Electricity Markets), utilities, independent renewable energy developers and a number of institutional investors.

Ernst & Young, through this independent paper identifies the investment barriers in each low carbon sub-sector and provides suggestions for suitable products that could be provided or facilitated by the GIB. This paper also considers a few structural options for the GIB and their advantages and disadvantages for debate and consideration.

Executive summary

The Green Investment Bank Commission recently recommended the establishment of a Green Investment Bank to accelerate investments into the low carbon sector. A number of financial institutions and industry stakeholders have expressed the support for the establishment of such an institution to help address barriers to investment, and to improve capital flows into the sector.

This report considers the role the GIB could perform in addressing these investment barriers and looks at the likely levels of capitalisation required for the GIB to be effective.

- ▶ A total funding requirement, in order for UK PLC as a whole to implement the country's low carbon agenda, is estimated to be approximately £450 billion until 2025, including all the energy efficiency programme capital requirements¹.
- ▶ Traditional sources of capital (utilities, other corporate, project finance and infrastructure funds) can only provide approximately £50-£80 billion² over the same period until 2025.
- ▶ Even with the active participation from institutional investors such as pension funds and insurance funds, the estimated funding gap is approximately £330-£360 billion.
- ▶ The timeframe and scale of the low carbon investments and their risk profile imply an enormous challenge, especially in the aftermath of the recent economic crisis.
- ▶ There is a significant opportunity for GIB to act as a bridge between institutional capital and ultimate investments. This will accelerate investments by providing an appropriate conduit.
- ▶ GIB should be strategically structured to appeal to the widest and deepest sources of capital as possible. At the same time, the products it provides to the industry should be competitive.
- ▶ There are a number of risk and financial products that GIB could facilitate in the offshore wind generation, Carbon Capture & Storage (CCS) and energy efficiency segments.
- ▶ The UK Government's fiscal challenge implies that it is important for GIB to be efficiently structured to reduce UK Government's fiscal contribution and avoid any consolidation of GIB liabilities from a fiscal, legal, accounting and economic perspective.
- ▶ Whilst a number of structures for GIB are possible to satisfy the above objectives, our analysis shows that, out of the three possible GIB structures that we have outlined, the most

¹ Ernst & Young analysis, third party reports from E3G, National Grid, DECC. This differs from previous analysis from Ernst & Young, which has focused solely on the capital investment likely to be required of the energy supply industry alone.

² Ernst & Young analysis.

efficient structure would require a tier-1 credit risk capitalisation level of £4-£6 billion over the spending review period until 2015.

- ▶ Based on other comparable institutions, more detailed analysis is required to be undertaken on the products the GIB could provide, its risk exposure and capitalisation requirements.
- ▶ A number of institutional capital providers should be engaged to implement the next phase of GIB product and structure design, policies and governance framework, which needs to be undertaken in conjunction with the relevant UK Government departments.

In the absence of an institution such as the GIB, the UK low carbon sector will not be able to access institutional capital of the scale required. The evolution of financing structures to access such capital is likely to take longer, and to be less efficient and less cost effective than with an institution such as GIB. Significant competitive advantage in the low carbon economy may be lost due to the paucity of capital.

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Introduction

In June 2010, the Green Investment Bank Commission (GIB Commission) published its report 'Unlocking investment to deliver Britain's low carbon future'³. The report, which proposed the establishment of the Green Investment Bank (GIB) to address the low carbon investment requirements of the UK, set out the investment challenges, the barriers and the potential role of the GIB in addressing those barriers. Some of the key challenges and barriers identified in the report were:

- ▶ Market investment capacity limits and limited utility balance sheet capacity.
- ▶ 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 investments attractive to institutional investors.

The GIB Commission suggested that the GIB should aim to open up flows of investment by mitigating and better managing risks by identifying and addressing market failures currently limiting private investment, and to support investments in such areas as energy efficiency, smart grids and third round off-shore wind. A vehicle such as GIB could play a crucial role in mobilising capital into the low carbon infrastructure sector and act as a bridge to plug some gaps that exists in the finance market resulting in lower capital flows into this critical sector.

This paper provides an initial analysis into the capitalisation needs of the GIB, and sets out the following:

- ▶ The scale of investment required to meet the UK's long term low carbon agenda.
- ▶ The commercial funding currently available from the private sector.
- ▶ A description of the alternative sources of private capital which the GIB could attract into the sector.
- ▶ A summary of the products that the GIB could introduce to address the investment barriers.
- ▶ Given the alternative sources of private capital and products that the GIB could introduce, a review of three options for structuring the GIB which in turn would require different capitalisation needs.
- ▶ Three scenarios as to how the bank might be capitalised.

³ Unlocking investment to deliver Britain's low carbon future – report by the Green Investment Bank Commission, June 2010.

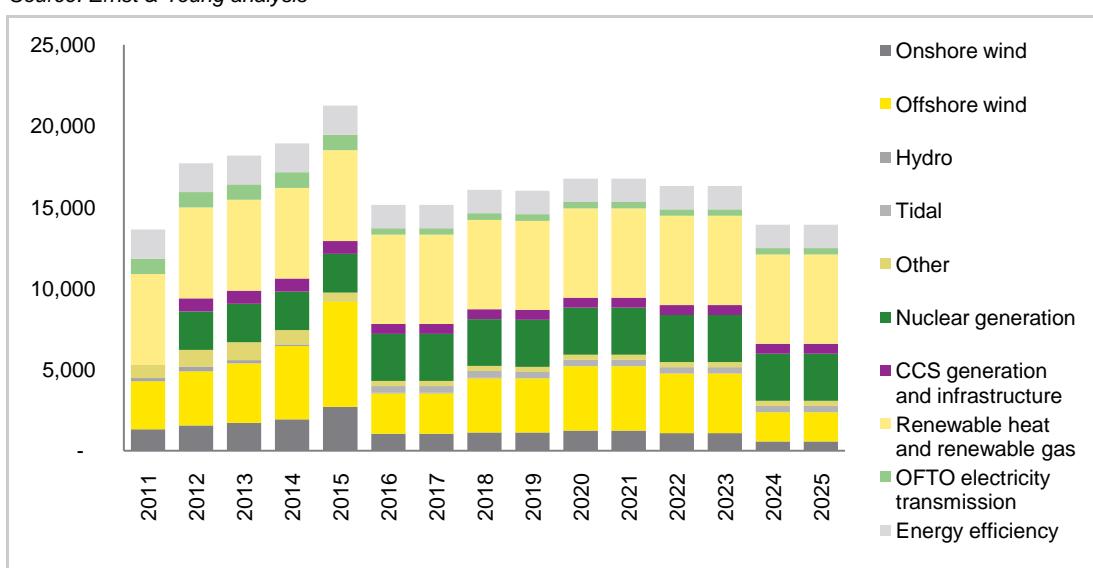
The scale of investment required

Since 2008, we have published a number of papers that have examined the scale of the likely investment opportunity in the UK Power & Gas Infrastructure sectors⁴. Our latest analysis suggests that the UK's energy supply industry is likely to have to fund approximately £170-180 billion of direct capital expenditure on Power & Gas Infrastructure for the period 2011-25, in order to meet the country's low carbon agenda and maintain adequate levels of supply security.

In addition to this, further investments are expected to be necessary, in order to encourage the adoption of renewable heat and renewable gas technologies across the country. This represents a further future cost of approximately £70-80 billion⁵. While this expenditure may not be incurred directly by the energy supply industry, we believe that it would fall appropriately within the remit of a Green Investment Bank and on this basis, therefore a total of £250 billion of capital expenditure could be required in the low carbon sector over the next fifteen years – equivalent to an average of £15-£16 billion per annum. Approximately £90 billion is required over the short term (2011-2015) and £156 billion over the longer term between 2016 and 2025⁶. The chart below illustrates the schedules of investments by technology where a bias towards offshore wind, energy efficiency, renewables heat and gas investments can be observed. The scale of this challenge is enormous. As we noted in our paper 'Value of Investment Decisions in the UK's Power & Gas Infrastructure'⁷ (February 2010), *"investment decisions of this scale are required to meet the UK's overall energy and climate change objectives whilst maintaining secure energy supplies"*.

Figure 1: capital expenditure projections in UK low carbon sector excluding energy efficiency (£ million)

Source: Ernst & Young analysis



It should be noted that the £250 billion quoted above includes £24 billion for energy efficiency investments, representing only the expected direct commitments faced by energy supply companies to achieve the countrywide roll-out of smart metering and to encourage the take up of energy efficiency measures through CERT and any similar replacement scheme. We are aware that some commentators have suggested that the aggregate capital expenditure required of UK PLC as a whole on energy efficiency measures could be as high as £230 billion⁸ over the next ten years, and this is not an unrealistic possibility. Again, we believe that such

4 Ernst & Young's Securing the UK's energy future – meeting the financing challenge, February 2009; Ernst & Young's Securing the UK's energy future – seizing the investment opportunity, July 2009; Value of Investment Decisions in the UK's Power and Gas infrastructure, February 2010.

5 Based on Ofgem's Project Discovery: Energy Market Scenarios of October 2009, and National Grid's The Potential for Renewable Gas in the UK in 2009 and various other industry publications.

6 Ernst & Young analysis.

7 Download at www.ey.com/uk/powerandutilities

8 Accelerating the transition to a low carbon economy – the case for a Green Infrastructure Bank – E3G, 2010.

capital expenditure could fall appropriately within the remit of a Green Investment Bank. This would then have the impact of nearly doubling the total funding requirement to £450 billion (calculated approximately as £250 billion less £24 billion add £230 billion).

It is this ultimate figure of £450 billion, representing the total amount of investment that may be necessary across UK PLC, that we have used in this paper to assess the potential capitalisation needs of the GIB.

Commercial funding currently available

Our forecasts suggest that only £50-80 billion of funding could be available from current funding sources (or £3-£5 billion per annum to 2025). Funding is currently available from three key sources:

1. Utilities – £30-45 billion (or £2-3 billion per annum)
2. Project finance debt and equity – £20-22 billion (or £1.2-1.4 billion per annum) which assumes that supply will grow by ten percent per annum from 2008 pre-financial crisis levels⁹.
3. Infrastructure funds – £7-15 billion (or £500 million-£1 billion per annum) based on an assumed five percent allocation of UK and Western Europe infrastructure funds into the UK low carbon sectors¹⁰.

Against the backdrop of a £450 billion funding requirement, this gives a funding gap of approximately £370-£400 billion over the next fifteen years.

Alternative sources of private Capital

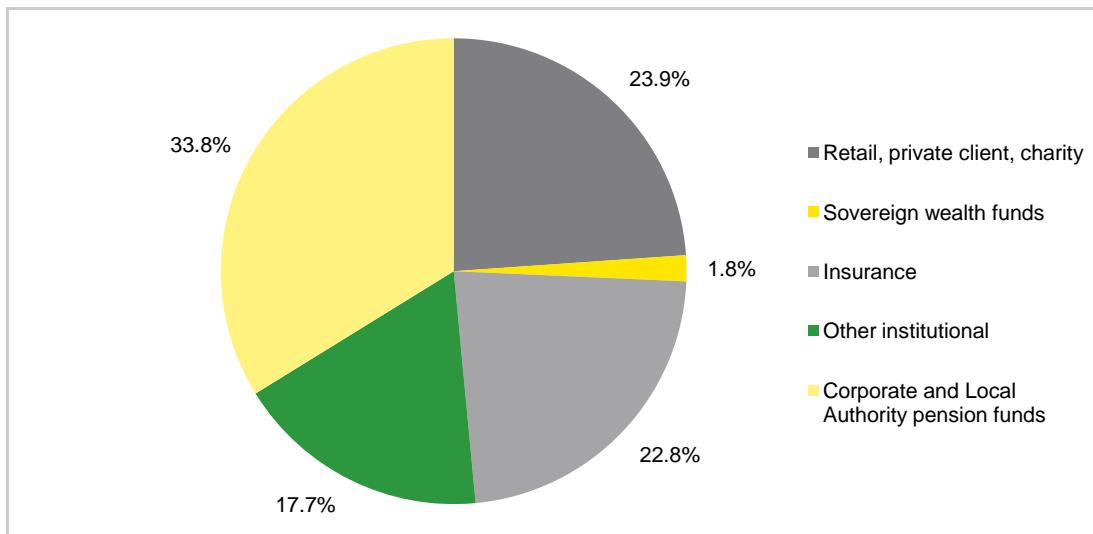
Beyond the traditional financing sources of utilities, the project finance market and the infrastructure funds, the other large sources of capital that could be attracted to invest in the UK low carbon sector is the managed funds market. Today, the UK managed funds market has approximately £3.4 trillion of total assets under management. Within the managed funds market, the institutional funds market constitutes approximately 78% of total assets managed in the UK, with pension funds and insurance funds making up 56% of these assets (See Figure 2 below).

⁹ Impact of new banking regulations and consequent capital impact on banks' project lending volume is not factored into this analysis.

¹⁰ Infrastructure funds have long-term institutions such as pension funds and insurance funds as their investors and lately, the limited partners are discussing material changes to their partnership agreements on fee structures and exits to align their objectives closer. Some of the funding projections from the infrastructure funds could be lower if large pension funds and institutional funds take a more direct route to investments in low carbon infrastructure.

Figure 2: UK assets under management (AUM) by client type

Source: *Asset Management in the UK 2009-10, Investment Management Association Annual Survey*



Our analysis prudently assumes that funding would not be available from retail funds or 'other institutional funds' because of the disparate objectives of the retail funds and the paucity of data available on the nature of other institutional funds. Nevertheless, the contribution available from pension funds and insurance funds could be as high as £25-40 billion effectively increasing the funding capacity by approximately 30%-75%, based on:

1. Pension funds providing 15-20% of their alternative investment allocation to infrastructure investments, of which 30-40% could be allocated to the UK low carbon sector. In addition, pension funds could also provide funds to GIB or GIB facilitated securities (provided they are long-dated, inflation indexed), resulting in an overall allocation of £11-20 billion out of their total asset base of £1.0 trillion.
2. Insurance funds can also provide additional funds to the sector by subscribing to securities issued by GIB and taking exposure to the underlying projects (provided they are inflation indexed, appropriately structured and quoted), resulting in an overall allocation of between £14-20 billion out of their total asset base of £1.5 trillion.

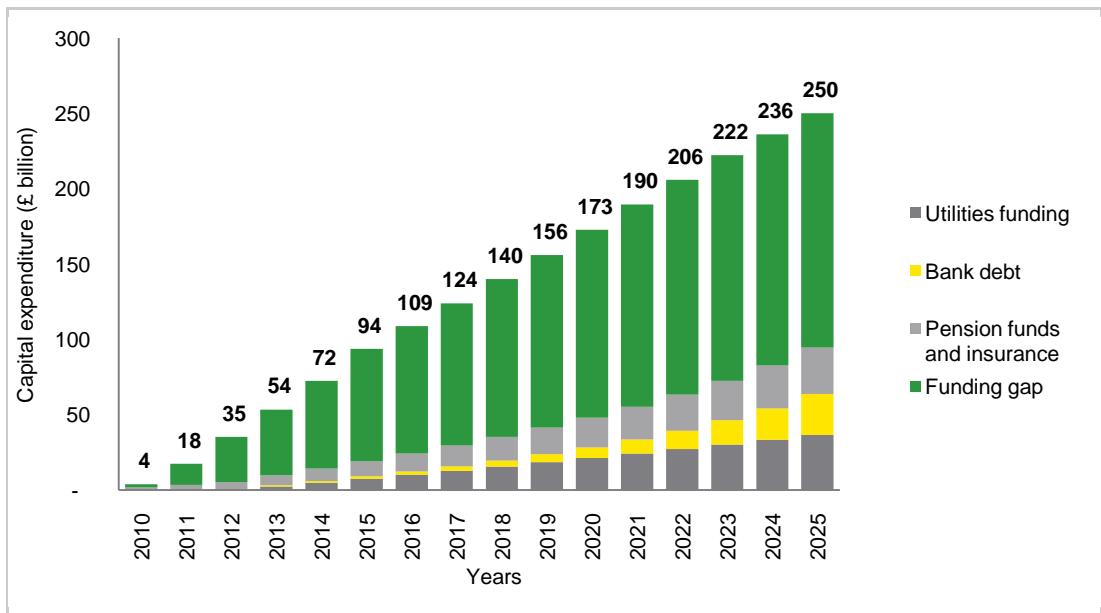
Based on the above, a funding gap of £330-£360¹¹ billion after including capital from the alternative private capital sources still exists. However, a number of products are required to mitigate the risk of investments such that they meet the requirement criteria of these alternative sources of capital. Institutional capital will provide funding during the immediate crucial period, and therefore provide a period of time for other sources, such as public equity markets and retail funding markets to feed through to funding the low carbon infrastructure either as a primary or a secondary source providing exit or liquidity to primary capital providers¹².

¹¹ This includes the energy efficiency investments of £200 billion, which if excluded will decrease the funding gap to £155 billion even after attracting institutional funds into the low carbon sector – see Figure 3.

¹² Institutional capital flows can be increased significantly into the low carbon sector if international economies and constituents have to recognise explicit costs of carbon providing significant diversification benefits to institutional investors who have a large allocation to equities/fixed income investments in carbon-exposed corporate.

Figure 3: funding gap excluding energy efficiency investments of £230 billion

Source: Ernst & Young analysis



Other alternative sources of capital such as the public equity markets have not been considered for the purposes of this analysis. Public equity markets, being one of the largest and deepest sources of capital, could provide significant liquidity and funding for a number of investments.

Retail debt markets such as Green ISAs or bonds could be attractive, provided there is a structure that attracts long-term capital (as opposed to short-term) and liquidity/exit mechanisms are provided to retail investors.

GIB products to address investment barriers

GIB could play multiple roles in accelerating the UK low carbon infrastructure investments. On the basis of our own experience in different sub-sectors of the low carbon economy it is evident that there are specific investment barriers in the following:

- ▶ Offshore wind generation
- ▶ Carbon, capture and storage (CCS) and associated infrastructure
- ▶ Large scale roll-out of micro-generation and energy efficiency

Each of the sub-sectors and issues are detailed below in terms of the pressing investment barriers and likely mitigating products that GIB could offer:

Offshore wind generation

1. There is a shortage of financial equity during the construction period if a large number of projects contemplated in Round 3¹³ and some existing pre-operational Round 2 projects need to be financed, due to constraints on project sponsors' balance sheets.
2. No form of capital cushion is available in the current market to address the inherent construction time and cost uncertainties (that is likely to increase with greater depth and distance from shore especially for Round 3 projects). A capital cushion will provide some comfort to banks to take construction risk on a limited recourse basis, which they have been reluctant to do so far, except in limited cases.
3. A key element that could optimize leverage and provide additional comfort to lenders would be a multi-year energy yield insurance product. This multi-year energy insurance product would mitigate some of the uncertainties of energy yields and availability due to adverse weather situations. There is no commercial insurer that provides such product, and we are not aware of any that would in the near future.
4. Post-financial crisis, a number of banks prefer to provide shorter term capital through appropriate loan covenants. In addition, due to the volume of projects projected to be built and operated, there is a huge capital requirement. Lack of long-term debt capital and resultant refinancing risks during the operating phase has led to a number of offshore wind developers to price in this risk in their investment models, making internal capital allocation even more challenging. A product that provides additional long-term debt capital and removes some of the refinancing risk would help to mitigate this risk premium.

Carbon Capture Storage and associated infrastructure

1. Due to the technological risk in the capture and storage elements, manufacturers have been reluctant to provide firm capital cost estimates. This has lead to higher risk pricing on capital costs and therefore impacted project economics for both lenders and investors.
2. Again due to the technological risk, manufacturers and suppliers have been averse to providing adequate bankable warranties. This has made it difficult for lenders to lend to such projects and increases uncertainty for investors.
3. Unit capital costs in this sector are very high. This increases concentration risk for utility sponsors, who have limited balance sheet capacity.
4. The commercial insurance market does not provide appropriate risk cover that would attract capital, unlike risk covers available from the market in the other large investment and unit capital cost intensive sectors such as the conventional power (coal and gas fired) generation sector.

¹³ Round 3 projects are those that have been auctioned recently by the Crown Estate on a zonal development basis with greater depths and distances from shore than Rounds 1 and 2.

This has resulted in projects facing high uncertainty in timeframes/timing and economics.

Energy efficiency

1. There is a lack of clarity and inordinate complexity on security rights over property for residential, commercial and industrial segments. The security rights are important for lenders and investors to fund these projects.
2. A lack of scale in various energy efficiency projects makes capital flow to the largest and reputed sponsors' deals.

There are a number of other traditional low carbon sectors including onshore wind that do not appear to have similar issues around risk capital, though the lack of financial capacity in the overall market may lead to financing constraints across the other sectors. As seen in the past in the infrastructure and other economic industries, capital always flows to the most attractive sectors that provide the most reasonable risk-return payoff with minimal barriers.

GIB products to address sub-sector investment barriers

Based on the above investment barriers, the following mix of risk and financial products for the different sub-sectors could be considered as being appropriate to attract capital:

Sub-sector	Long-term capital	Short term capital	Risk cover
Offshore wind generation	Senior debt through bonds to recycle short-term bank debt.	Subordinated debt to increase capacity and to encourage banks to take construction risk for UK offshore projects. Construction equity to bridge equity funding gap and supplement the utility equity funds.	Short term callable capital or risk facilities to cover contingent construction risk. Credit guarantees for long-term capital providers such as insurance and pension funds. Multi-year energy yield risk cover for availability and extreme weather events.
CCS	Long term senior debt post-commercialization phase.	Subordinated bridging debt to plug funding gap.	Potentially for reinsurance to be provided to cover any gaps from insurance but not used for product or capitalization analysis in this paper.
Energy efficiency	Senior debt through bonds.	Not applicable.	Default risk product through a credit guarantee for wrapping bonds issued to long-term institutional funds.

Products provided by GIB

A brief description of each product is below:

- ▶ **Short-term construction equity:** GIB could provide additional funds to bridge the funding gap in the construction equity segment by providing up to 20% of equity, for example, for a number of projects in the offshore wind subsector that satisfy certain investment criteria. This equity investment will carry all typical equity risks and will have other typical minority equity corporate governance arrangements.
- ▶ **Long-term debt capital for offshore, CCS and energy efficiency projects:** GIB could provide long-term debt to the various offshore and CCS projects. This could be in the form of bonds subscribed to by GIB or limited GIB guarantees for project bond issuance, in order to make these projects attractive to institutional debt capital. For CCS projects, some of the risks could be taken by the Government instead.
- ▶ **Medium term secured subordinated debt (subordinated to senior secured debt provided by commercial banks) for both offshore and CCS projects:** this will increase the willingness and ability of commercial banks/other lenders to take limited recourse project risk during the construction risk. This subordinated capital will provide an additional capital cushion in the event of construction cost overruns arising from delays or complexities or both. The same risk cover could be provided through guarantees for a certain portion of senior debt in the event of construction overruns or through callable subordinated debt that GIB will inject again in similar circumstances.

- ▶ **Multi-year wind insurance for offshore wind projects:** GIB could underwrite five-year senior secured multi-year wind insurance products. This insurance would provide capital cushion and smooth the cash-flows for senior lenders during the operating phase, the variability of which arises from energy yield variability and poor availability arising from extreme or unusual weather events. GIB could either reinsure this with other commercial insurers and could bring in substantial scale and diversification benefits to this product. By being in a position to recover its insurance payouts (if it needs to pay in a particular year) over a medium period, it minimises risk for capital providers and may allow effective leverage.
- ▶ **Default risk guarantee product for energy efficiency projects:** as an alternative to providing long-term debt capital to small scale large rollout energy efficiency, micro-generation and smart grid projects, GIB could provide credit risk default guarantees over the long-term to the actual institutional lenders. Due to the diversity of projects across residential, industrial and commercial sectors, GIB could provide such risk cover to more projects than any commercial provider of such insurance. Through appropriate legal security, it should be possible for such energy efficiency projects to achieve an underlying credit rating of BBB- or above.

GIB structural options and issues

The capitalisation needs of the GIB are informed in part by the products that it will provide and the way that it is structured. In setting out the structural options for the GIB, we are cogniscent of the need to meet the following objectives:

- ▶ A desire to minimise the capitalisation needs of the GIB given the current financial consolidation measures intended.
- ▶ For GIB to be off balance sheet for the UK Government from both public sector accounting and rating agency perspective.
- ▶ For GIB to be able to provide capital at competitive rates.
- ▶ To provide access to pension and insurance funds to projects by fulfilling their investment criteria. To mobilise this capital at its level, GIB would however need to have a high investment grade.
- ▶ For the GIB to act as an aggregation vehicle for smaller investments (for example in the onshore/micro-generation and energy efficiency sectors) and in so doing provide access to cheaper funding.
- ▶ To accelerate the low carbon infrastructure investments in a short timeframe with speed and ease of set-up playing an important role.

Although there are a number of structural options for GIB that are currently being considered, this section considers three potential non-exhaustive structures against the above objectives:

GIB structure – Option A

GIB could be set up to provide all risk capital products and funding products (long-term and short-term debt and equity) within the same institution without any demarcation of the different sectors or products. We understand that this is the option currently being considered by Government.

GIB would provide risk diversification across sectors and projects to GIB financers at the GIB level. It is likely that until GIB establishes an operational track record and has established default rates and recovery rates on various products, the institutional funders will be looking for a high level of capitalisation at the GIB level or explicit guarantees from the UK Government. In our view, this is likely to take a few years.

Except for secured construction phase sub-debt and construction equity for high-risk projects in the offshore wind sector, all other debt provided by GIB would be secured, senior and pari-passu with project senior debt provided by commercial banks and other lenders such as the EIB to the respective projects. This will alleviate any competition concerns from commercial banks. By being agnostic to the nature or identity of the commercial banks providing project debt to the underlying projects, GIB will not discourage competition. If it were to provide funding to select institutions, it may be considered as doing so.

The main advantage of this option is that due to the high level of capitalisation support or explicit guarantees from the UK Government, the cost of funding for the projects may be much cheaper than external commercial banks. GIB funding from institutional funders is likely to be priced off Gilts plus a structural and liquidity premium and would be of course, dependent on the nature of the UK Government's support to GIB. In this form, the GIB would be fairly easy to setup with minimal time taken.

Other advantages of this structure is that GIB has complete control over the funding and risk products it provides to various projects and can tailor them as per the needs of the projects, subject to satisfaction of criteria on rating, funders requirements and its balance sheet constraints. Thus the GIB can tailor its covenant package for the individual projects according to the individual projects' risk profile. The amount of capital that is required to support GIB's

funding to projects can be altered over a period of time depending on the nature of the projects it finances. Nevertheless, there is a limitation on the flexibility that it has on the covenant package and pricing, due to its co-lending requirement for competition and commerciality reasons outlined above.

However, there are a number of disadvantages of this option, some of them being:

- ▶ This set-up may seem to be contravening 'state-aid' rules and commerciality principles, as it is seen to be favouring some sectors (green energy sector). This could possibly be overcome, if the GIB lends to various sectors on an arm's length commercial basis.
- ▶ The entire debt issuance of the GIB would be consolidated on UK balance sheet by public sector accounting rules. Due to explicit support from the UK Government, rating agencies will also consolidate this debt onto the UK Government's fiscal measures.
- ▶ Institutional funds do not obtain any economic risk or benefit to the underlying assets. A number of institutional investors have expressed a desire to obtain such exposure instead of increasing their Gilts exposure. There are also structural subordination issues with respect to the underlying project security through this structure, which can only be mitigated by high capital or explicit support from the UK Government to GIB.
- ▶ Unless the issuance of GIB is explicitly guaranteed by UK Government or GIB is highly capitalised, commercial lending banks may not obtain comfort that GIB will provide take-out of their debt once the operating phase commences.
- ▶ Commercial banks will be unduly concerned about the interference of GIB and the UK Government in a commercial lending activity and would view GIB as competing against them during the initial phases, unless GIB is explicitly mandated to act in a similar capacity to the EIB. Through this, GIB will not act on its own and will only co-lend or complement other commercial lending sources, similar to current EIB lending. However, GIB would be free to provide risk products that improve the lending appetite of commercial lenders for renewable energy projects through suitably structured financial risk products.

GIB structure – Option B

GIB is set up to provide credit guarantees for all sectors and products (long-term and short-term debt) within the same institution. In this capacity, GIB would not provide any capital to any sector (except for construction equity), but would rather act similar to a mono-line institution to the extent required by the multiple funding sources.

GIB would act as a Credit Guarantee institution providing guarantees to funders on specified amounts of project loans or specified risks, up to a pre-agreed amount per project through a guarantee thereby enhancing project credit for the actual funders. It is not envisaged that the GIB provides any funding to any project in any sector in any phase.

The credit enhancement being provided by the UK Government could be structured in a number of different ways.

Under one structuring option, the UK Government could provide sufficient capital to GIB at the outset that would enable it to enhance projects' credit ratings. This capital would act as first loss capital for the various projects thereby enhancing project credit ratings to an acceptable level. Under another structuring option, UK Government could provide initial UK Government capital plus UK Government commitment to provide additional pre-defined limited capital to GIB, if the capital is required subsequently. This additional capital can be drawn to maintain adequate capital ratios for maintaining support to the various projects upon reaching a first loss residual level at GIB. It may be possible to achieve this additional capital commitment through a letter of

comfort or MOU¹⁴ with GIB, similar to its arrangements on Transport for London, capped at a known amount for each of the low-risk and high-risk projects.

Beyond this initial capital and additional commitment, no other capital would be available from UK Government or others, at least for the initial period. This will provide clear clarity to rating agencies that UK Government capital to GIB is not unlimited but clearly defined, and limited in quantum and risk profile. In return for the credit guarantees, GIB could charge a guarantee fee from the project with the guarantee fee tiered up as per the underlying project risk levels, tenor of such guarantee, and quantum provided to such projects. Please note that the intention of GIB would not be to charge a 'market rate' that could be prohibitive, but a fee that reflects the cost of capital at the GIB level plus risk premium.

Underlying projects will be funded:

- ▶ During construction phases, by banks and third party equity. Banks' loans will be supported through a limited amount guarantee thereby enhancing banks' recovery rates, in case of a default due to pre-defined risks.
- ▶ During operational (or less risky) phases, by pensions and insurance funds and other bond investors. Their loans will be supported through a similar limited amount guarantee enhancing the underlying projects' credit rating and making low carbon sector lending attractive to long-term institutional funding. The amount of such limited amount guarantees that is being provided by GIB will vary according to project, sector and phase and should be enough for the project loans to achieve a high investment grade credit rating (A and above).

Since the GIB is not providing any funding to the underlying projects, there will be less cash impact on UK Government than under Option A. However, underlying projects will not have the benefit of a lower cost of funding that a UK Government fully guaranteed institution will achieve. The banks will only reduce the risk premium on their loans to the projects but will still be charging underlying funding costs. Therefore the overall funding costs (including the GIB guarantee fee) may make the projects more expensive than under Option A.

Nevertheless, a principal advantage of this structure is that the pool of financial capital available for funding such low carbon projects increases in the market, which will lead to plugging the capital gap in the low carbon sector.

Another major advantage of this structure, is that the pension and insurance funds could obtain access to the underlying economic risks and benefits of the project assets that we understand they wish to have (operating phase with indexation benefits) whilst in other construction projects, commercial lenders can take the degree of risk that they wish, with the rest being taken by GIB.

This structure may lead to 'State Aid' and 'Commerciality' issues, if the guarantee fees are not structured and priced appropriately. If they are commercially priced, then the underlying projects may be more expensive or equity returns reduced.

For the post-operating phase projects that require participation from the institutional funds such as pension funds and insurance funds, the underlying issuance after GIB's credit enhancement has to be rated minimum 'A' rating. This will enable a higher volume of assets to be funded by pension/insurance funds, as part of their asset allocation to corporate securities or Government-linked securities.

Due to the credit enhancement features in this structure, this could potentially be attractive not just to UK pension and insurance funds, but also other bond funds and overseas funds interested in investing in and obtaining exposure to the UK low carbon sector. Moreover, GIB does not have to be concerned about providing liquidity for the institutional funds, as it is up to the funds to structure them and GIB's role is limited to the guarantees it provides.

¹⁴ This particular issue is quite complex and would require extensive discussions with GIB product beneficiaries who would require comfort that this 'callable capital' actually is available when needed based on the underlying commitments and documentation.

GIB Structure – Option C

Under this option, GIB is set up with different functions and activities ring-fenced within different GIB entities. There would be three subsidiary vehicles named for the purpose of this paper as GIB1, GIB2 and GIB3 as follows:

1. The first entity GIB1 being an entity that provides short-term to medium term risk capital and funding products for projects during their construction and risky phases, when there has not been an operating track record or when default and loss ratios have not been fully established. For the purposes of our capitalisation analysis, the sectors covered would be offshore wind generation and carbon, capture and storage. Other sectors could also be included within this phase, but our report assumes similar products for these sectors as the offshore wind generation and CCS sectors.
2. The second entity GIB2 being an Asset Management firm that manages multiple projects during the lower risk infrastructure operating phase. This asset management firm will manage these projects for interested insurance and pension funds which will take full direct economic exposure and risks and will provide capital for these projects. GIB will not take any economic stake in these projects but will provide industry expertise, efficiencies and scale in such management for the long-term management of such projects on a limited or no profit basis.
3. A third vehicle GIB3 that acts as a conduit or a vehicle into which loan originating banks transfer their loan portfolios of geographically spread small-scale renewable, micro-generation and energy efficiency projects. A significant percentage of the loan capital will be provided by insurance and pension funds on a long-term basis. A small first loss protection up to a suitable level would be provided by loan originating banks. GIB may either provide similar first-loss equity capital or a second-loss subordinate debt to the vehicle to ensure that the debt securities issued by such vehicle can be high-investment grade and can be priced efficiently for the end-consumers over the long-term.

GIB1

GIB 1 will act as a 'risk bank' providing short term risk capital and guarantees, as the case may be, to projects during risky phases. This will act very similar to GIB under Option A. GIB1 will be funded by the UK Government and other multilateral institutions for the initial capital, to the extent required for co-lending to projects. Guarantees could either be capitalised or structured through callable capital to provide comfort. In case of the latter support for coverage on the guarantee or risk products being provided by GIB1, GIB1 would be directly backed by the UK Government through additional capital contribution commitments or letter of comfort similar to GIB under Option A.

GIB2

GIB 2 will act as an asset manager for these above projects during their less risky operational phase. Loans and if desired equity capital, will be provided by insurance/pension funds who will take 'economic risk and exposure' to underlying assets without GIB taking any residual risk. Such funds may also take equity stakes in these projects, depending on their appetite and capacity for infrastructure equity allocations.

Key considerations with GIB2 as an Asset Manager are as follows:

- An important structural consideration for institutional funds is providing them access to the underlying project cash flow characteristics including inflation indexation benefits.
- An emerging issue for a number of infrastructure investors looking to invest in renewable energy infrastructure is minimum threshold size and quantum of their investments and the lack of such assets in the current market. By aggregating many projects into a portfolio with specific risk characteristics, GIB2 makes investments attractive to funds.
- Most infrastructure funds that are currently active in the renewable energy sector have a limited life of five to seven years and therefore want an exit within that period achieved

through a sale. A number of pension funds have much longer time horizons and this structure could provide them with a long-term investment structure that is currently not available and therefore attractive to the institutional funds market.

- The current funding model does not have the diversification benefits that this potentially large infrastructure fund could have across different low carbon asset classes. GIB2 could have multiple underlying sub-funds to enable institutional funds to choose their basket of 'risk-reward' as they wish. Larger pension funds could invest directly into the underlying projects or portfolio with appropriate corporate governance arrangements.

GIB3

GIB 3 would act as an aggregator for other 'small-scale renewable' and 'energy efficiency assets' through a Structured Vehicle.

This structured vehicle could be co-owned by a number of banks, GIB3 and other institutions that express such interest.

Banks would be originating loans to the end-consumers. Once critical mass is reached on a periodic basis, these assets would be pooled together and the transfer of such loans to the Structured Vehicle would be through a 'True sale' transfer by such originators to GIB 3. It would be possible for originators to take a first loss piece (say up to 5%¹⁵) by retaining equity in the secured loan portfolio. The advantage of this structure for the originators is that they obtain access to a securitisation vehicle that is fairly transparent and not subject to the vagaries of the general financial markets, as for example now. This vehicle could also be used by originating corporates who finance these projects as part of their energy efficiency programmes.

GIB3 may choose to provide an additional second loss piece through a subordinated loan to the Structured Vehicle or co-own (up to an additional say 3-5%) to top-up the first loss relief provided by originators.

Underlying projects would continue to be owned by project sponsors whether it is utilities, independent developers or others. Through the above loss-pieces and portfolio diversification (residential, industrial and commercial end-users diversified across UK geography), the underlying projects would have a high chance of achieving investment grade rating making them attractive to institutional lenders.

There are a number of ways that GIB3 could play a role. It could be a warehousing vehicle that warehouses the loans that originators originate before they securitize their loans into the wider financial markets. Or GIB3 could act as a lender to the underlying projects by on-lending through the banks. This is the structure that Kreditanstalt für Wiederaufbau (KfW) adopts in Germany in the Small-Medium Enterprise segment, whereby KfW then securitises these SME loans through its securitisation vehicles.

There are a number of advantages of GIB3 being structured in this way, in that the underlying projects will benefit from the low cost funding of KfW with the originator banks taking the origination spread and credit risk/spread. However, KfW's liabilities are fully guaranteed by the Federal Republic of Germany that results in substantial low cost funding to KfW and draws in a number of institutional investors wanting a yield premium over and above the German bunds. A warehousing structure works, subject to appropriate arm's length arrangements. Another option would be for GIB3 to purchase the loan assets once it reaches a certain aggregate volume of assets from the origination bank and then securitizing it. It is this last option that has been considered for GIB3 for a number of reasons:

1. Through pooling multiple loan assets from multiple banks, diversification benefits for insurance and pension funds would be significant.

¹⁵ Under revised BASEL 3 rules, originating banks are required to hold at-least 5% of first loss piece in the assets they securitize.

2. GIB3 would not have to hold significant amounts of capital on its balance sheet, but acts purely as a conduit through which banks can securitize their loans and free up capital for additional loans.
3. Through this mechanism, the institutional funders have direct exposure to UK energy consumers.

Underlying projects will have multiple risk profiles due to different consumer profiles. It is important for GIB3 to consult on underwriting criteria with the originating banks and the institutional lenders. Also critical is for GIB3 to delineate the concentration risk default characteristics of the underlying projects. Some of these parameters may not be clear until the issue on security over the underlying projects are clarified and confirmed. If DECC, Ofgem and other regulatory authorities devise a mechanism whereby such underlying project cash-flows could be secured, this mechanism may prove viable for GIB funding.

GIB capitalisation scenarios

Under option A, the capitalisation requirement would be £7-£10 billion. Options B and C require capitalisation levels of between £4-6 billion. It should be noted that the GIB credit risk tier-1 capitalisation levels¹⁶ are driven by a number of assumptions (which would require further testing and detailed modelling) including:

- ▶ Ernst & Young analysis and estimated cost overruns, equity and long-term capital outlay requirements on offshore wind, CCS and energy efficiency, converted into GIB exposures in low, medium and high scenarios of build-out, leverage, and capital cushion.
- ▶ Due to the lack of lending track record of GIB, a Standardised Approach to capitalisation has been undertaken. This methodology assigns risk weights and credit conversion factors to a number of different risk and financial products. Based on the products identified, assumptions for credit conversion factors and risk weights for various products such as subordinated debt, senior debt, equity, insurance and guarantees have been taken and used in this report¹⁷.
- ▶ It is also assumed that there is no increase in risk weights for longer term products such as long-term debt, guarantees or subordinated debt for the purposes of calculating the GIB capitalisation levels.
- ▶ For energy efficiency and micro-generation projects, it is assumed that the underlying project loan portfolios (originated by the banks and others) will be rated by an external credit rating agency and will transfer to the GIB vehicle on the basis of a true-sale from the originating banks to GIB3. These loans (pre-enhancement) would be expected to be investment grade prior to their credit enhancement due to diversity as explained before in the section on products and risk weights have been assumed accordingly¹⁸.
- ▶ We have assumed two capitalisation rates to calculate GIB's tier-1 credit risk capitalisation levels. Notwithstanding the above assumptions and analysis, we have compared GIB capitalisation rates to other comparable institutions such as the KfW, European Investment Bank ('EIB') and ('Instituto de Crédito Oficial') ICO. Based on preliminary analysis of these institutions, most of these institutions (except EIB) carry explicit or implicit support from their host governments. With a large and well-diversified asset base, EIB is the exception, but this has a significantly high tier-1 capital ratio. Therefore the tier-1 capitalisation rates assumed in this paper may have to be increased further and would depend on the structure of the GIB and its policy and underwriting standards. The risk-weighted assets calculated for arriving at the tier-1 capitalisation levels in this paper, would also depend on the actual financial and risk products.

This analysis suggests that a high tier-1 capital ratio may be more appropriate than that prescribed. It should be noted that under the recently announced BASEL-3 framework, capital requirements may be substantially higher than arrived at in this paper.

¹⁶ Tier-1 capital levels have been calculated in this report. Institutional funders in GIB may require other forms of capital in GIB, to provide them additional comfort. Other capital requirements mandatory for similar institutions such as for operational risk (risk of loss from inadequate processes, systems or event risk) and market risk (risk of loss from movements in macro-economic variables) are explicitly not considered due to the need to construct a very detailed GIB financial model.

¹⁷ Financial Services Authority Handbook BPIRU3 and BPIRU6.

¹⁸ Financial Services Authority Handbook BPIRU3.

Summary

A number of conclusions can be derived from our report:

- ▶ There is a significant funding gap for the UK to reach its 2020 low carbon targets from existing traditional financing sources such as utilities and the infrastructure financing market and it is important to attract other sources of long-term institutional capital with urgency.
- ▶ A number of sub-sectors such as offshore wind generation, carbon capture storage, energy efficiency and micro-generation are faced with investment barriers, which preclude traditional funders from providing long-term, low cost capital.
- ▶ Long-term institutional capital providers' interest in this sector could take off enormously, provided there is a structurally robust policy framework and organisational structures are created to facilitate their investments. .
- ▶ In order to attract and leverage institutional capital into the low carbon investments, it is important for an institution such as GIB to address market and investment barriers that are prevalent in multiple subsectors of the low carbon economy.
- ▶ A number of properly targeted structured products tailored to each sub-sector and phase, such as subordinated debt, equity, long term loan capital, guarantees and insurance products could mitigate these investment barriers more efficiently than on a single project by project basis. These structured products could be provided by GIB.
- ▶ GIB could provide or mobilise institutional capital through a variety of structures, risk and financial products. Depending on the option chosen, different capitalisation levels are required from UK Government and other institutions to fulfil its role adequately. However it is crucial to 'optimise the GIB leverage' to maximise its impact on the sector investments.
- ▶ Whilst choosing the form of GIB, it is important to consider treatment of its liabilities on UK Government from a public sector accounting, credit rating and economic perspective. It is also important to address other issues such as flexibility, competitiveness of GIB products, speed or time to implementation, attraction to institutional capital and efficient large scale roll-out of small scale micro-generation and energy efficiency programmes.

What next?

- ▶ More detailed analysis needs to be performed to review the most efficient form of GIB but initial analysis and modelling suggests that GIB would require initial tier-1 credit risk capitalisation of approximately £4-£6 billion for the more efficient options over the coming spending review period (2015).
- ▶ A number of institutional capital providers should be engaged to implement the next phase of GIB product and structure design, policies and governance framework, which needs to be undertaken in conjunction with the relevant UK Government departments.

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