Chapter 16

Climate bonds – the investment case

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Introduction

There is now a broad international consensus among governments, corporations and the public that urgent action is required to cut greenhouse gas emissions. This consensus is built upon a widespread acknowledgement that climate change will impact the livelihoods of a majority of the world's population and leave few areas of the economy unaffected. The challenge now is to mobilise the capital required to invest in alternatives to fossil fuels, and to make the infrastructural investments that are necessary for adaptation to climate change.

This capital is required urgently as greenhouse gas levels continue to rise, causing changes in climate patterns that are resulting in economic disruption. According to the International Energy Agency (IEA), each year of delay adds a further $1 trillion to the bill for the transition to a global low-carbon economy.

Reducing dependence on fossil fuels and adopting a low-carbon economy is of global importance, and is a priority for policy-makers in both developed and developing economies.

However, many governments are severely constrained in their ability to invest in greening their economies, given already extended public balance sheets and fragile global economic conditions. It is clear the vast majority of the required investment must come from mobilising private sector capital, in particular from the institutional investors that manage the bulk of the world's private wealth.

The largest portion of funds managed by institutions is allocated to the bond market. It is estimated that more than $95 trillion of bonds were outstanding in 2010.[1] Of this amount, 72% is held by long-term investors such as pension funds, mutual funds, insurance companies and sovereign wealth funds.

The challenge is not to create new capital, but to shift a portion of existing investment into low-carbon development.

There is evidence that a growing number of fund managers and advisers are now seeking to align their investments with the low-carbon agenda. This is not just

1 *Bond Markets*, CityUK Financial Market Series (July 2011), www.thecityuk.co.uk.

in response to public opinion, but also because they see new opportunities arising from green technologies, as well as threats to conventional investments from climate change. Although some investors are calling for greater policy certainty before making investments, others are already demonstrating their commitment by investing in bonds and other instruments that are specifically targeted at financing low-carbon projects.

It is in this context that a market has developed for 'climate' and 'green' bonds, which are defined as asset-backed or ring-fenced bonds designed to raise finance for climate change mitigation projects that deliver genuine reductions in emissions, or for climate change adaptation measures.

Although the market is relatively small in size, at about $12 billion (July 2011), climate bond investors have a growing appetite for products that can be independently verified as contributing to the financing of a low-carbon economy.

The development of a market for climate bonds (used interchangeably with the term green bonds) is supported by the Climate Bonds Initiative, an international network comprising a group of more than 50 leading finance and climate experts, together with some of the world's largest institutional investors. One of the Climate Bond Initiative's key projects is the creation of an International Standards and Certification Scheme that will promote the integrity and liquidity of this important market.

The immediate low-carbon financing need

Climate change presents one of the greatest challenges ever faced by the global community. Practically every economic activity, including production, transport and construction, is founded upon the use of fossil fuels that produce high carbon emissions. As more countries make the transition towards industrialisation, so the world faces greater risks as energy consumption rises.

A structural shift in key sectors of the global economy is required to ensure that future development is placed on a sustainable footing. This will encompass investment in many sectors, including clean energy, and also in the infrastructure and technology required for delivery. As an example, the successful adoption of electric vehicles needs the installation of charging points or battery exchange stations as well as the development of vehicles that meet consumer expectations. Reducing energy consumption in the construction sector requires retrofitting existing stock as well as the construction of efficient new buildings.

At the same time, more and more countries face the expense of investing in new infrastructure to adapt to the effects of climate change that are already being experienced. For example, municipal, coastal and agricultural areas require climate-proofing infrastructural investment to ensure that clean water and food supply is secured.

The investment required to achieve transitions to low-carbon transport, low-carbon energy and low-carbon buildings is estimated by the IEA to be $1 trillion a year

above business as usual.[2] If the sustainable management of natural resources such as forests, fisheries, agricultural land, water and tourism is included, an average investment of $1.3 trillion per year is required out to 2050, according to the UN Environment Programme's Green Economy Initiative.[3]

In the EU alone, the consulting group Accenture has calculated that €2.9 trillion of investment is required by 2020 to support the deployment of 15 low-carbon technologies in electricity generation and transmission, transport and buildings.[4]

However, the capital deployed to date is a small fraction of what is required to effect the necessary transition to a low-carbon economy. Investment in clean energy reached $243 billion in 2010, with asset finance comprising the largest component of this at $127.8 billion.[5]

Many people believe that the key to unlocking the required investment lies in wholesale capital markets, and especially the $95 trillion bond market. To achieve this, bond issuers need to deliver products that meet defined low-carbon objectives while offering acceptable risks and returns for investors.

Policy perspective

Although there has been no international agreement on climate change following the UN Framework Convention on Climate Change meeting at Copenhagen in 2009, governments around the world are unilaterally introducing climate-friendly policies and regulations.

The EU has long championed low-carbon economic development and is now considering strategies that would deliver 80–95% reductions in emissions by 2050.

China has committed to carbon intensity-based reduction targets and is actively promoting policy support for low-carbon industry sectors. China recently announced its 12th Five-Year Plan for 2011–15, which sets out specific targets to reduce carbon intensity by 17% and increase non-fossil fuel energy to 11.4% of primary energy consumption, together with ambitious investment budgets for clean energy and environmental protection.

And the US, which lacks a federal framework for climate change mitigation, has kick-started low-carbon industries and has a target of producing 80% of its electricity from clean technology by 2035.[6]

However, austerity measures in many industrialised countries have severely limited the scope with which governments can use tax revenues to support low-carbon projects. This is particularly relevant to energy and infrastructure projects, which

2 International Energy Agency, *World Energy Outlook 2010*, www.iea.org.
3 UNEP (2011), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, www.unep.org/greeneconomy.
4 Barclays (2011), *Carbon Capital: Financing the low carbon economy* – a report prepared by Accenture. London, UK.
5 www.bnef.com/PressReleases/view/134.
6 www.reuters.com/article/2011/01/26/us-obama-speech-energy-idUSTRE70O50V20110126.

often require secure long-term revenue streams to enable up-front finance to be put in place. As a result the cost of capital for these projects has increased significantly.

This is exacerbated in countries with developing economies which face higher financing costs because of country risk ratings. The capital-heavy nature of renewable energy investment often makes it much more expensive than traditional energy generation and as a result capital has been largely flowing into fossil fuel-based technologies.

Policy-makers have responded to calls for certainty by introducing carbon pricing through emissions trading systems, or carbon taxes in the form of price floors. While carbon markets are important for the long-term sustainability of a low-carbon economy, poor market design and low prices have meant that insufficient investment has flowed to low-carbon projects to date.

Clean energy technologies require more targeted support, particularly for long-term revenue streams. Feed-in tariff (FiT) regimes have been introduced across Europe spurring a scaling up of global manufacturing in the solar photovoltaic and wind industries. However, the risk for prospective long-term investors, such as bondholders, is that successor governments may undermine such revenue support. Poor investment sentiment has been exacerbated by recent discussions aimed at amending existing subsidy schemes, notably in Spain, the Czech Republic and the UK.

Investment perspective

The unfortunate reality is that government policy responses have yet to deliver an adequate framework for meeting the risk/return requirements of long-term institutional investors. From a fund manager's perspective, climate change presents both a potential risk to conventional investments, but also an opportunity to participate in a huge and dynamic new low-carbon economy. What is certain is that no investor can afford to ignore the issue, as climate change will undoubtedly alter macroeconomic conditions as well as the business environment for most corporations around the world.

With these considerations in mind many of the world's largest fund managers are already factoring the impact of climate change into their investment decisions. This has led to institutions making investment allocations based upon criteria that take account of the projected effects of a rise in mean global temperatures. For example, Denmark's ATP pension fund has set up a $1 billion climate change investment fund and, last year, the California State Teachers' Retirement System (CalSTRS) instructed managers to incorporate climate risk into their investment analysis and corporate governance voting practices.[7] The Norwegian Global Fund, one of the largest in the world, has been active in shifting funds away from investments regarded as harmful to the environment.

7 www.pionline.com/article/20100111/PRINTSUB/301119988.

In February 2011, leading investment consultant Mercer released a major report looking at how institutional investors could begin to mitigate climate risks in their portfolios. It concluded that allocating investment to climate-sensitive assets – such as infrastructure, agriculture, timberland and real estate – can help to de-risk portfolios from the impacts of climate change compared to a business-as-usual scenario.[8]

It is not only institutions that are factoring climate change into investment decision-making. Many individual savers are now taking a greater interest in ensuring that their investments are managed responsibly and towards stated objectives. This has led to a rapid growth in socially responsible investment funds – almost doubling from $2.7 trillion of assets under management in 2008 to approximately $5 trillion in 2010[9] – as well as the nascent green bond market, where bond issuers use proceeds for low-carbon projects. To date around $12 billion equivalent of green or climate bonds have been issued, with investors targeted in specific markets ranging from Japan to Scandinavia.[10]

However, if such deal-flow is to scale up rapidly to meet investment requirements under climate change scenarios, climate bonds will need to compete in a mainstream investment environment that prioritises commercial returns above any social or environmental considerations. Specifically, the underlying characteristics of bonds will need to align with investors' needs in terms of price, credit risk and liquidity to match existing asset allocation strategies.[11]

Tapping bond markets to combat climate change

The emergence of a climate bond market presents an opportunity to stimulate private investment into the low-carbon economy, aligning investor appetite to projects with stated climate objectives.

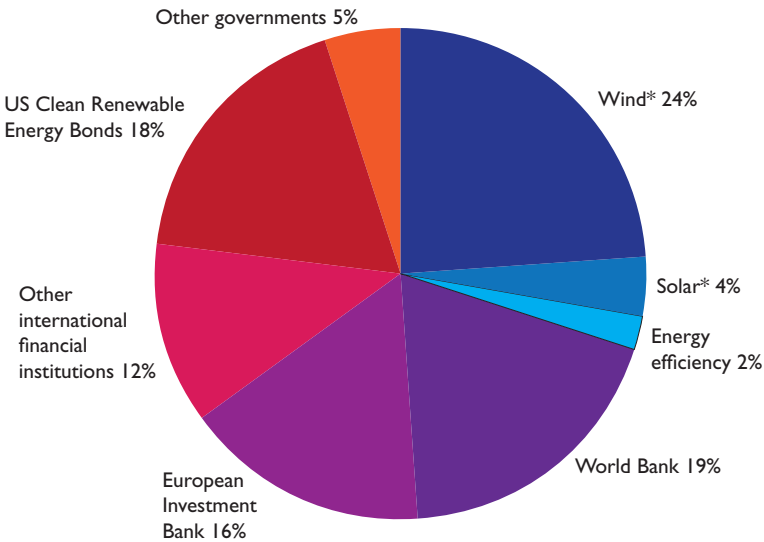
Climate bonds are themed, asset-backed or ring-fenced bonds specifically issued to finance climate mitigation and adaptation measures. They are designed to fit the portfolio requirements of investors while meeting rigorous low-carbon financing criteria. The market for climate bonds is only a few years old but is growing strongly, with $4 billion–8 billion slated for release in 2012. As more and more investors seek to engage with the low-carbon economy, so climate bonds could become the key to unlocking the vast potential of the international bond market to bridge the financing gap.

The emergence of a climate bond market presents governments with a range of policy instruments to stimulate private investment into low-carbon projects. They could support the market directly through preferential tax treatment, or through the provision of partial guarantees. Alternatively, governments could support the

8 Mercer (2011), *Climate Change Scenarios: Implications for strategic asset allocation*. London, UK.
9 Eurosif (2010), *European SRI Study 2010*. Paris, France.
10 www.climatebonds.net.
11 Institutional Investors Group on Climate Change (2011), *Positioning Paper on Green Bonds*.

Figure 1. Breakdown of climate bonds market

Total climate bonds issued: $12 billion



** asset backed or corporate.* *As at March 2011. Source: Climate Bonds Initiative*

market indirectly through stable climate-related policy and regulatory frameworks, such as FiT regimes with locked-in, long-term characteristics, which would support the financial strength of bond issuers. In these respects governments could replicate the policy environment previously enjoyed by the fossil fuel industry.

To date, a number of bond issuers have used thematic bonds to raise finance for targeted low-carbon projects.

The first climate bond was issued by the European Investment Bank (EIB) in 2007: €600 million with a maturity of five years and an index-linked coupon with a minimum 5% pay-out. The EIB's programme of Climate Awareness Bonds[12] totalled $1.98 billion equivalent in fixed- and floating-rate formats at August 2011.

The first 'vanilla' green bond, a Skr2.85 billion issue with six-year maturity and 3.5% fixed-rate coupon and proceeds ring-fenced for climate change projects, was issued by the World Bank in November 2008 and was placed mainly with institutional investors. Since then the World Bank has followed through with 41 individual bond issues denominated in various currencies, and each targeted at specific investor segments. By January 2011 an equivalent of $2.2 billion had been issued.[13] Other international finance institutions that have issued green labelled bonds include the

12 www.eib.org/investor_relations/documents/eib-cab-newsletter-2010.htm.
13 http://treasury.worldbank.org/cmd/htm/WorldBankGreenBonds.html.

International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB) and the European Bank for Reconstruction and Development (EBRD).

The US government has taken a lead in supporting the issuance of clean renewable energy bonds (CREBs) by providing tax incentives for investors, and is promoting legislation to support energy conservation efforts through Property-Assessed Clean Energy (PACE) programmes.

Asset-backed bond issuance is beginning to attract investors. Early financings, such as the 2006 and 2007 Breeze bonds portfolio issuances totalling $1.6 billion and the 2006 $129 million Alte Liebe issue, were downgraded by credit rating agencies as a result of lower than expected wind strength and thus lower cash flows than expected.

However, market conditions in the wake of the financial crisis have led to more innovative bond financing structures developing for project finance. Examples include Alta Wind Energy Centre, a 3GW wind farm project funded in part by a $580 million bond in 2010 and the first major solar project bond, launched in 2010, when Sunpower/Andromeda Finance raised $260 million. In an example of conducive government support, the Sunpower bond was partially supported by a credit enhancement facility from SACE, the export credit agency of Italy, where the 44MW solar farm is located.

There is considerable scope to scale up the supply of climate bonds. Barclays and Accenture estimate that €1.4 trillion could be unlocked by 2020 through the securitisation of long-term low-carbon project loans and lease financing in the EU alone.[14]

Tools to grow the climate bond market

The Climate Bonds Initiative (CBI) was set up to bring together key participants including investors, industry and governments to help crystallise the rapid emergence of bond finance for the low-carbon economy. The CBI comprises some 50 finance and climate experts from around the world, together with organisation partners including some of the world's largest institutional investors.

The CBI is developing a series of models and financial architecture designed to provide supporting infrastructure to facilitate bond investments that credibly contribute to transitioning to a low-carbon economy. This includes an International Standards and Certification Scheme for climate bonds.

Standardisation of climate bonds

Currently there is little in the way of standard terms and definitions that investors can use to verify that the proceeds of climate bonds are specifically applied to fund low-carbon projects. Without standardised terms the growth of the market is likely

14 Barclays (2011), *Carbon Capital: Financing the low carbon economy* – a report prepared by Accenture. London, UK.

to falter, as investors need confidence that bond issuers are actually using funds in a way that contributes to building the low-carbon economy. Indeed, some issuers such as the World Bank have already found it necessary to obtain independent verification of their 'green' claims to re-assure investors.

The CBI has established a standards and certification scheme for climate bonds, backed by a broad-based coalition of asset-owners, NGOs and key stakeholders from the financial and low-carbon industry. A working prototype of the standard was released in late August 2011, after a lengthy, transparent process of stakeholder consultation and participation.[15]

The scheme aims to reduce the cost of labelling and verification for issuers and for investors through the development of agreed standards for thematic climate bonds. It is expected that their adoption will help enhance liquidity and build critical mass for climate bonds.

Within the standards and certification work stream there are expert committees, comprising market, industry and legal professionals, which are developing industry-specific criteria. The creation of acceptable standards is by no means straightforward. For example, although it is relatively easy to define the contribution to climate change mitigation of renewable energy bonds backed by wind and solar power assets, it is more challenging to create standards for bond issues which support ethanol plants with debatable emission profiles. What level of emission reductions should qualify?

The standards and certification committees must take account of secondary impacts – for example, supporting an electric vehicle infrastructure roll-out without the parallel decarbonisation of the electricity grid. Can enabling technologies such as broadband infrastructure result in the desired emission reduction impact? While the complex nature of these issues suggests that absolute definitions could remain elusive, agreeing transparent standards will be essential to supporting climate bonds as a mainstream asset class.

Investors in green bond issuance to date have largely been attracted by the prestige and trust engendered by major supranational institutions such as the World Bank and the EIB. However, even with these issuers, transparency and standardisation has been sub-optimal. When SEB Bank was mandated to underwrite and place World Bank green bonds, an independent audit of the product's environmental claims was commissioned as part of its labelling due diligence. The findings of this review, conducted by Oslo-based research centre CICERO, drove the ring-fencing of specific capital expenditure programmes that gave the underwriter the confidence to label the bonds as 'green'. The EIB argues that it does the same for funds raised through Climate Awareness Bonds and allows for public monitoring of disbursements through its financial statements.

15 www.climatebonds.net

As private sector players and other stakeholders enter the market, the questions of agreed and credible definitions become more urgent. climate bonds have progressed from plain vanilla bonds solely issued by supranational institutions, to corporate bonds for projects supported by feed-in tariffs, and to hybrid structures such as index-linked bonds based on a basket of green companies' performance or the achievement of certified emission reductions.

To support the growth of climate finance, standardised definitions will need to be formulated down to the sub-classes of climate bonds including those issued by governments, corporations and infrastructure projects.

A financing bridge to a low-carbon economy

Climate bonds offer the ability for investors and policy-makers rapidly to scale up finance and action for the transition to a low carbon economy. There is growing appetite from the investment community for bonds that are specifically targeted at financing the low-carbon economy. However, for the market to grow and for liquidity to develop, investors need tools to help them monitor and verify the climate effectiveness of their investments.

It is clear that the private sector will shoulder a large part of responsibility for delivering low-carbon economic transition, especially given the tight fiscal conditions that many governments are experiencing. A large and liquid climate bond market will stimulate innovation from banks, issuers and policy-makers alike and will make an important contribution to bridging the financing gap that currently exists.

The incentives to create this environment are strong for the key stakeholders. Governments need to be able to signal encouragement for and track private capital financial flows in investment-poor areas of the economy. Investors need to be able to signal particular investment areas which they are interested in and assure the public that institutional capital is being invested in their interest. The public needs to know that a vehicle for catalysing large-scale financial flows to ensure future environmental stability is available and that the financial sector is supporting this future.