Trillion dollars p.a.
International Climate Bonds Proposal

DRAFT

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NETWORK for SUSTAINABLE FINANCIAL MARKETS

This paper follows international modelling which identifies industrial development times as the critical constraint to avoiding dangerous climate change. The modelling suggests that an unprecedented public-private partnership may be the only solution to address this issue in the time available.

Background – Urgency

We are now 15 years on from the Rio Earth Summit. In that time, global emissions have risen beyond the IPCC's most pessimistic emissions scenario, climate change has been persistently worse than predicted, and what seemed the then theoretical possibility of catastrophic extreme events increasingly look like certainties. World leaders have yet failed to make a meaningful deal; even if they did so now it would probably not be enough to avoid the worst effects of Climate Change, and it is highly uncertain that any targets that are set would be credible.

Current trajectories of emissions growth will lead to a collapse in the world economy

1. **The climate challenge has become a choice** between controlled climate change and un-controlled or 'run-away' climate change. The former will lead to impacts that may result in global warming of 2^0C, a 5-20% loss of GPD and impacts such as sea level rise of up to 2 metres. The run-away latter would lead to large temperature increases and sea level rises of 7 to 25m (IPCC 2007) and a unprecedented and irreversible change in the world's environmental, social and economic geography. Controlled or adaptive climate change may be within the adaptive capacity of modern societies; run-away climate change is not.
2. **Run-away climate change** occurs when stabilising influences on the climate (such as oceans absorbing CO2) are outweighed by the de-stabilising effects on the climate (such as methane releases from melting tundra). A system is no longer under self-regulating control when destabilising feed-backs exceed stabilising feed-backs. Run-away climate change means rapid, non-linear change to a new, much hotter, climate regime.
3. **Run-away climate change is estimated to occur at about 2^oC**. Some 'tipping-points' may occur before that point, some after. Avoiding 2°C of warming requires avoiding more than about 1800GtCO_2e being released into the atmosphere by 2100. This in turn means achieving average emission below 2tCO_2e per person per annum by 2050, which compares to current average emissions of 24tCO_2e per person in the USA and 4tCO_2e in China.

The Problem:

1. Unless emissions are dramatically cut, we face the spectre of unprecedented, run-away climate change and a consequent collapse of the world economy.

We have a five year window to get low-carbon industries growing at 25-30% p.a.

1. To avoid 2°C global warming the world will need rapid growth of low-carbon industries, including clean energy industries for power, heat & transport; energy efficiency; and terrestrial carbon industries for farming and forestry.
2. Industrial modelling by Climate Risk Ltd, commissioned by the international conservation organisation WWF, shows that to achieve the 2^oC emission levels, low-carbon industries will need to undergo a massive growth rate of 25-30% per annum year on year across industrialised and industrialising societies. The scale of the low-carbon re-industrialisation will be three times larger than the industrial revolution.
3. We have a limited amount of time to get low-carbon industrialisation underway: It must begin by at least 2014. Why? Because empirical evidence suggests that 30% annual industry growth is a real-world upper limit for industrial expansion. Thus, though the necessary low-carbon resources and technologies already exist for reindustrialisation, they cannot be grown faster than this upper limit. The time to grow industries to sufficient scale has become the defining constraint to avoiding run-away climate change.
4. The Kyoto II negotiations have gone too slowly to allow sufficient development of low-carbon re-industrialisation in time using carbon trading systems alone. Even a successful global agreement will fail to achieve the scale of transformation necessary if the process of low-carbon re-industrialisation is not commenced within three years, five at the outside. A complementary industrial development measure is therefore critical.
5. There are numerous examples of such mobilisation of industry, financed by debt instruments and strong central planning effort to direct investment. Whether in World War II, the post-war Marshall Plan, the rebuilding of Eastern Europe after the fall of the Berlin Wall, or even China's current Highway Program, when the world chooses it is able to respond to urgent need.
6. All of these examples rely on a close working relationship between industry, finance providers and government. Therefore we conclude that this is what is needed now.

The Problem:

2. Due to real-world industrial development constraints, the window to initiate global low-carbon re-industrialisation is less than 5 years.

NETWORK for SUSTAINABLE FINANCIAL MARKETS

The Problem

1. Investment for the transition to a low-carbon economy needs to be ramped up quickly otherwise high emission industries are locked-in, and low emission industries stay small and expensive.
2. Most of the world's capital is locked into the carbon economy. Although The Stern Review estimates the cost of mitigation to be only 1% GDP (based on an over-optimistic target of atmospheric CO2e concentrations the world can carry), this estimate ignores the destruction of large amounts of capital both natural and financial, from climate change itself, and the extreme and potentially disastrous disruption that this capital loss will bring to society, including disruption to further mitigation efforts. Very few precedents exist - the closest being war - where the pathway of an economy is changed so rapidly and drastically.
3. Governments do not by themselves have the capital resources to properly address the necessary speed of the transition. As well, capital flows will have to be cross-border, with some 60% of investments needed in the developing world, particularly so China and India and other rapidly developing economies do not get locked into high carbon industry. As fraught post-Kyoto negotiations have shown, national governments have found it difficult to agree on formulas for the scale of international transfers required.

Solution

Enable finance and industry to re-industrialise the world

1. Economies of scale from low carbon re-industrialisation will result in all renewable energy forms becoming cheaper than fossil fuel over the period 2020 to 2050, even without a global carbon price. This means that a revenue stream to create a return on investment can be drawn from savings once the cost-curve for renewables drops below that of fossil fuels.
2. Climate Risk modelling calculates the required investment to make up the cost difference between low carbon energy and fossil fuel energy, until it reaches sufficient scale to be independently viable, at US$10 trillion. This is different than the total required capital investment for infrastructure; climate risk investment is only required for the 'clean' component of the costs, the rest being met by the regular operations of the energy market.
3. Institutional investors have, globally, some $120 trillion of funds under management. The US$10trillion investments required would be less than 10% of today's funds under management, excluding future inflows. Consequently institutional investors, potentially led by pension funds, have the resources to fully fund needed low-carbon re-industrialisation — if they can achieve secure and sustained returns.
4. A critical role exists for governments to develop mechanisms to use public funds and guarantees to create investment opportunities for private investors that will encourage private investment in the short term and that will create viable, secure returns in the long term. For example, steps by governments to establish energy pricing base-lines that subsidize renewable energy until it becomes less expensive than fossil-fuel-based energy ("feed-in tariffs") could reduce investor risks and provide security for returns, unlocking large-scale national and cross-border energy-related private investment and development in renewable energy.
5. Re-industrialisation will need to focus on low-carbon energy generation and infrastructure (distributed energy, new fuels such as concentrated solar in deserts, geothermal, wind, wave, and tides, and supergrids to distribute power over long distances), but could also encompass energy efficiency, low-carbon agriculture and support to maintain forests in critical habitats.

A Solution?

Cut through the Kyoto stalemate with a trillion dollar per year Public Private Partnership.

Fund it with Climate Bonds, perhaps underpinned by governments maintaining energy prices at fossil fuel levels, without price disruption for consumers.

Questions to address

The key question, while we wait for a post-Kyoto regime to be slowly implemented, is "how can we raise finance on an adequate scale and pace for the low-carbon re-industrialisation required in both developed and developing nations?"

In particular:

- What financial instruments would allow this to happen?
- What practical steps are required of developed and developing world government to provide adequate security for investors? What mix of government interventions are required?
- How do we most efficiently engineer appropriate clean energy deal flows?
- What can industry players do to support the re-industrialisation required?
- What sorts of institutional support do we need, if any?

Options for Climate Bonds

A range of ideas for climate bonds have been discussed in different fora. The ideas presented here are not necessarily refined, nor are they mutually exclusive, but the goal of each is to create investment opportunities large enough and secure enough for pension funds and other private investors, while producing significant capital pools to drive low-carbon reindustrialisation. We present some "sketches" below for exploration.

Option A: **International Climate Bond secured by feed-in tariffs**

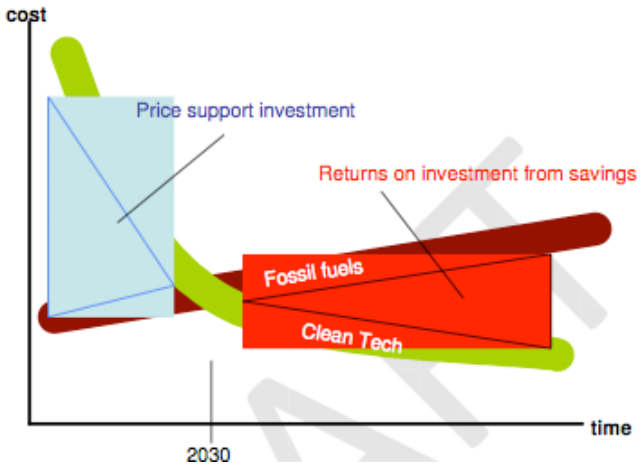
By Karl Mallon and Sean Kidney, Climate Risk Ltd

An opportunity exists for the private sector to profitably fund the core of a low-carbon re-industrialisation process by investing to create scale in the short term, leveraging long-term returns from the resulting energy cost savings. This, at a pace sufficient to avoid runaway climate change. The key to this idea is for governments to fund feed-in tariffs to subsidize the excess costs of renewable energy until that energy is cost-competitive with fossil-fuel based energy, and for the bond issuing agency to have contractual rights to receive financial returns from energy authorities representing the difference in cost between renewables and what business as usual fossil-fuels would have cost (feed-out tariffs). This mechanism will encourage private investment in otherwise difficult-to-finance long term projects.

Economies of scale will reduce costs below business-as-usual creating savings which are more than adequate for a return on the inward investment required (based on analysis in Climate Risk's report to WWF 2009).

An intrinsic component of an industrial transformation will be a change in the energy price regime, driven by economies of scale. Currently renewable energy technologies generally cost more than fossil fuel based energy sources, and are therefore priced out of the market. However, if driven to larger scales this situation reverses.

Since the fuels for renewable technologies (i.e. biomass, wind, sun, tides, geothermal, etc.) are obtained at zero or low cost, the core cost stems from building plant to extract that energy. Empirical evidence provides a reliable guide to future cost declines. On the other hand, fossil fuel costs are likely to increase due to fuel extraction costs, reductions in supply and the cost of managing greenhouse gas pollution as policy initiatives increasingly put a price on carbon. In Climate Risk's modelling the crossover at which the first new renewable energy industries start to create net savings is 2027; by 2050 all of the major renewable resources are able to provide energy at costs at, or below, those projected for business-as-usual.



Short-term price support to achieve economies of scale can be repaid with long-term returns from the cost savings.

This trajectory presents a plausible long-term investment picture in which short-term price support from governments to achieve economies-of-scale is repaid with long-term returns from the cost savings.

This idea presents an investment scenario that is similar to that found in energy performance contracting, whereby capital to carry out energy efficiency upgrades is provided by a third party company, which is repaid through savings from reduced energy expenditure. This picture also has parallels to the development of major infrastructure projects such as bridges and roads using government bonds repaid with user fees (tolls).

Scheme structure

1. International Climate Bond Authority ("ICBA") ('the Authority') established by institutional investors as the administrator and compliance enforcer of Climate Bond market. Authority defines compliance regime required to minimise risk for investors; licences auditing agencies to vet and verify bond issuance and funded projects. It could be like the IASB, a private accounting association that has rapidly established IFRS as the international financial reporting standard. It would need to negotiate bilateral "treaties" with energy authorities and governments, but would avoid multilateral negotiation problems. It would possibly, for credibility, need the backing of an entity like the World Bank.
2. Bonds can be issued by Governments, large companies, or international institutions, subject to agreement and compliance with ICBA regulatory conditions.
3. To issue Climate Bonds, organisations will have to be registered with the Authority, and contract to abide by international operating rules and standards, including standards for low carbon re-industrialisation.
4. Bond issues are registered with the Authority, which also appoints verification and auditing agent (licenced by the ICBA) for each issue or project. Auditing fees (agreed schedule of charges) are paid by bond issuer or projects.

5. Private or public pension funds and other institutional investors ('the Investors') invest in Climate Bonds, creating a capital base for the Authority.
6. Project Development companies ('Developers') will be able to register to develop compliant renewable energy projects ('Projects') under the Climate Bond Scheme.
7. A participating country government (the Government) enters into long term agreement with the Authority which specifies three key elements:
    a. The Authority and the Government agree a long term projection for business-as-usual (BAU) energy costs to 2050.
    b. The Authority will allow the Climate Bond capital to be used to create a feed-in tariff (which covers the cost difference between conventional energy and renewable energy in that country)[1]. This can operate alone, or in parallel with existing country feed-in tariff schemes. This investment is recorded and disclosed by the Authority.
    c. The participating Governments agree that the Authority will be paid the cost difference between energy from future Projects and the agreed BAU energy price, until such time as the pre-agreed return on bond has been achieved (e.g. via a 'Feed-Out Tariff').
8. The scheme is competitive with annual installed capacity targets across a range of renewable and energy efficiency resources to ensure prices closely follow costs. Typically renewable energy costs decrease by 20% for every doubling of installed capacity. Under the climate risk modelling renewable energy industries would be doubling their annual install capacity every 3 years.
9. The time limit for Project operations under the scheme is to 2050. If any net investment is outstanding against the bonds, the Government agrees to make good the investment at an agreed reduced rate of return.
10. The Authority will be responsible for:
    - Developing supervisory mechanisms to ensure project compliance.
    - The licencing of independent parties to act as accreditation providers for individual projects.
    - Internationally setting of and certification of compliance with agreed standards for being low-carbon – provides investors with confidence in carbon reduction outcomes.
11. Developed and Developing Countries Equivalence: The Climate Bond does not need to differentiate between developing and developed countries, working equally in both. Country risk would be reflected in required returns. At least 60% of global investment in these areas needs to be in developing economies. The scheme would be pro-development – investment raised would be returned as developing countries prosper.

Private standard-setting is becoming common in the global economy.

Some private standard-setting involves public authorities: global banks used World Bank social and environmental performance standards as the basis of the Equator Principles for infrastructure lending.

Other standards are created by wholly private entities, such as the private International Accounting Standards Board's (IASB) development of International Financial Reporting Standards (IFRS), now in use in over 120 countries.

Increasingly private actors see a governance or finance problem, and take the initiative to address it*.

* Steven Bernstein & Benjamin Cashore, *Can non-state global governance be legitimate? An analytical framework*, Regulation & Governance (2007) 1, 1-25.

How it could unfold …

In late 2009 the group of the world's 10 largest pension funds and several other institutional investors established the 'International Climate Bond Authority' in New York. Collectively the Authority would supervise 10 trillion dollars of projects by 2020.

At the same time three countries signed up to the mechanism, the US, India and Indonesia. They did this by agreeing to allow the ICB Authority to recover its investments through future energy cost savings, at an agreed long-term discount rate of 5%.

Climate bonds, compliant with Authority requirements, have been issued by both the Authority and partner institutions and taken up by the foundation investors and by other funds as well. Modest retail offerings in the US have also been successful.

By mid-2010 a handful of project development companies have registered with the Authority and have had proposals for funding in participating countries judged as compliant. The Authority has begun ongoing auditing regimes for each project, with periodical reports being received by investors.

What Does this Achieve?

The objectives of the Climate Bond Framework are:

1. To allow investors to be able to achieve a low-risk return on investment at rates consistent with government bonds.
2. To allow multiple companies to develop multiple projects in multiple countries using the same mechanisms with minimal transactional barriers,
3. To allow development to occur in any country regardless or state of development or domestic carbon or energy policy context.
4. To avoid any cost penalty to tax-payers or energy users compared to BAU.
5. To allow projects to be developed at all states of commercial technology development (and therefore place on the cost curve).

[1] Fossil fuel subsidies would be corrected for in the scheme to ensure the Climate Bond was not used to pay the difference against artificially lowered prices.

Option B: **A proposal for long dated zero-coupon bonds**

By Nick Silver

Pension funds invest now to pay future pensions, with a typical time frame of 20 years, but which could be up to 30-40 years. There currently exists few investment vehicles to match these liabilities, which are typically linked to future salary growth and/or inflation.

Pension funds today are locked-in to the carbon economy – a large proportion of the stock market is made up of energy companies or companies whose business depends on the exploitation of fossil fuel energies (e.g. airlines, car manufacturers, oil, gas and mining, and even retail). This state of affairs is at odds with the required movement to a low carbon economy over pension funds' investment time frame and therefore represents a serious risk to funds' performance. Properly structured, long dated zero coupon Climate Bonds could address both pension funds' liability matching and the need for pension funds to shift to low-carbon investment in order to mitigate climate risk in their investment portfolios.

Who will issue the bonds?

The bonds have to be guaranteed by an entity which is likely to be creditworthy when the bond matures, otherwise the counterparty risk will be too great. These could be:

- National, State or even Municipal governments.
- Government-backed institutions, e.g. energy infrastructure authorities or government-owned banks.
- Multi-lateral institutions, such as the World Bank or EBRD, or regional organisations such as the EU.

How would the bond work?

The bond will pay nothing before maturity (zero-coupon). On maturity it could be designed to pay the initial nominal value increased by the greater of inflation plus GDP growth or the return on the underlying fund. Maturity dates will be 30–0 years. Since the invested capital would be used for low-carbon reindustrialisation, as the cost of carbon increases the value of these bonds in the secondary market should also increase.

Where will the money go?

A special purpose vehicle will be set up. This will be an investment fund, run on a commercial basis, the purpose of which will be to develop low carbon technologies and other mitigation measures (including, for example, support to maintain forests in critical habitats such as the Amazon).

A variation could be a series of vehicles designed to have specialist sectoral expertise, such as in renewables, energy efficiency and agricultural development.

Motivation

Attractive investment for pension funds

The fund would be designed to pay out ***at least*** nominal GDP growth over a long time period, which makes it a very attractive investment for pension funds. There is also upside potential, which gives pension funds diversification exposure and reduces the concentration of risk they currently carry from being overexposed to companies which are large emitters of greenhouse gasses. This could be especially important given possible declining levels of oil and gas production in the future. Government underwriting minimizes counterparty risk. The advantage over existing 'green' investment funds are the guarantee, possible lower administration costs and a longer-term investment horizon.

Attractive financing method for Governments

The long-term nature of these bonds links the challenges of climate change to the problems of low savings and the aging population, which could be an added lever for government buy-in. For example:

- As the assets are a good match for pension fund liabilities, volatility in funding will be reduced by comparison with conventional investments, reducing the risk of final salary schemes for parent companies, and reducing the risk to pension funds from parent company bankruptcies.
- Many countries (e.g. the UK) and many US states have unfunded public sector defined benefit pension schemes. Possibly the only viable reform to make them fiscally sustainable would be to move towards partial funding. The carbon bonds would be an ideal investment, "killing two birds with one stone."
- In the EU there is a move away from Pay-as-you-go (PAYGO) pension systems to individual personal accounts; i.e. in the past state pensions systems worked by pensioners being funded via the tax system by current workers. This system breaks down with an aging population – the pool of workers decreases relative to the number of pensioners, rendering the system unsustainable. Governments are attempting to replace PAYGO systems with individual accounts – people are compelled (either by law or by default) to invest in personal accounts. One of the problems with personal accounts is a suitable investment vehicle, many people are wary of or do not understand conventional investments such as equity. The carbon bond would be a perfect investment vehicle – government guaranteed, linked to GDP growth, of lower volatility than equity investment.

Inter-generational equity - Due to the long dating of the bond, future generations are effectively funding climate-change mitigation, which is equitable as they are the beneficiaries. Governments will not therefore have to reduce current expenditure.

Option C: **A proposal for national index-linked bonds**

The greatest risk embedded in carbon credits isn't that governments won't agree on long-term reduction targets, but that they won't have the backbone to enforce those targets once agreed on. Now two founding members of the London Accord have proposed a hedging instrument that forces government to put their money where their mouths are.

By Professor Michael Mainelli, Z/Yen Group and Jan-Peter Onstwedder, The London Accord

Potential climate change investors have one big doubt: are governments committed to de-carbonizing the economy? Developers of low carbon projects (such as wind farms or solar companies) face two major problems turning ideas into reality. The first is showing attractive returns. The second is raising capital. Most low carbon projects will provide attractive returns only if government policies lead to lower emissions, higher fossil fuel prices and higher carbon prices. Uncertainty about government commitments creates risks which developers, and their investors, are not keen to bear.

Governments claim they are committed, but history raises doubts. Lack of confidence in government commitment impairs investment. Lack of confidence also leads to low prices for carbon. For example, the EU ETS market Phase 1 (2005 to 2007) carbon price crashed in 2007 when it became apparent that EU governments had jointly issued far too many permits to emit, i.e. clearly they weren't committed to reductions. Despite numerous white papers, there is little confidence that the UK government will meet its carbon emission reduction targets. Further, the worsening economic environment leads governments to talk about 'temporary' easing of carbon reduction commitments at the same time as easing demand lowers carbon prices.

The uncertainty about government commitment manifests itself in three specific risks – government carbon emission targets being missed, fossil fuel prices remaining low, and carbon (emissions) prices remaining low. Missed targets, low fossil fuel prices and low carbon prices reduce the profitability of clean energy, or cause losses. How can these risks be hedged?

One traditional hedging mechanism is to issue index-linked bonds. Index-linked bonds are not uncommon. Indices such as inflation and commodity prices have been used by governments and by corporations to set the amount of interest on debt. An attractive option would be for project developers to issue bonds indexed to the three key risks – government performance against targets, fossil fuel prices against a break-even level, and carbon prices against a break-even level? Such an index-linked bond would reduce the cost of capital for a developer exactly in those situations where the profitability of clean energy is threatened by government action, or inaction.

Bonds indexed to emissions, fossil fuel prices or carbon prices would transfer the risk from the developer to the investor. But we know that investors are not keen to bear those risks, either, from their reluctance to fund many clean energy projects. Investors cannot easily hedge those risks, but that is exactly where government can help – by issuing debt with the opposite risk profile. Index-linked government carbon bonds would provide greater returns if government falls short of achieving its targets, if fossil fuel prices remain low, or if carbon prices remain low. That kind of index-linked gilt could easily be issued, and it would provide a natural hedge against our project developers' government risk. An investor would invest in a low-carbon project (either equity or debt), and simultaneously buy a proportion of index-linked government carbon bonds.

As an example, take an investor looking at investing in a 2010 wind farm that is competitive at £55/megawatt-hour. Say that the price of fossil fuel derived power is £50/megawatt-hour in 2010, with a government target of £75/megawatt hour in 2015. The index-linked gilt to provide a hedge would pay a margin over normal gilts (a type of bond issued by the Bank of England), with the margin a function of the fossil-fuel derived power price.

For example, for every £1 below £75, the interest rate could go up by 1%, with a suitable cap at say 20%. For every £1 that the fossil-fuel derived power price is above £75, the interest would reduce by 1% with a minimum of zero. An investor in such gilts would be able to offset the price risk of his or her investment in the wind farm.

Other structures are possible, too, linking the principal repayment to fossil fuel prices, or either interest rate or principal to actual emissions in, say, 2020.

The UK government claims it is serious about meeting its carbon emission targets, serious about moving to a low carbon economy. The UK government is likely to issue a large number of gilts over the next few years due to the credit crunch. By issuing carbon bonds linked to independent, auditable index metrics such as emission targets, the price of fossil fuel and the future carbon price, the UK government would remove private investors' objections that their biggest uncertainty is government commitment. Likewise, given that failure to perform will cost, government would have a real incentive to meet its emission targets.

So come on, UK government. Put your money where your mouth is and make a real commitment, issue index-linked gilts and remove the biggest risk stymieing low-carbon project developers, you.

Other Climate Bond initiatives

This is not an authoritative list; there will be more, especially at national levels. We thank Richard Doornbosch and Eric Knight for their OECD Discussion Paper, "What Role for Public Finance in International Climate Change Mitigation," prepared in 2009 for the OECD Roundtable on Sustainable Development, for much of the information in the following section.

RePowerUK Green Bond proposals to UK Government, April 2009

RePowerUK is a group lobbying for green infrastructure investment by the UK Government. Participants include the Renewable Energy Association, Greenpeace, Friends of the Earth, The European Climate Foundation, E3G, Climate Change Capital, Green Alliance, and NSFM.

An April 2009 submission to the UK Government about green infrastructure financing as part of the government's economic stimulus package was prepared on behalf of the group by Ingrid Holmes of Climate Change Capital and Nick Mabey of E3G.

The paper proposed the creation of a Green Treasury Gilt, essentially a government bond hypothecated to green infrastructure investment. The idea of the proposal was to quickly raise funds to leverage private investment in low carbon infrastructure, delivering a green fiscal stimulus in the short term and growth opportunities in the longer term.

Because of the shorter-term stimulus rationale, the paper argued that the proposed Green bonds should be made very easy for investors to understand, i.e. in as conventional format as possible. Non-standardised structures would require significant up-front investments in time and money for investors to fully understand the risk profile of the new product; that would lead to delays and suboptimal prices and levels in investment.

The proposed bond would carry the following characteristics:

- Fixed maturity date - reflecting policy design requirements for capital and likely to be long-dated (15+ years);
- Two semi-annual payments on fixed dates 6 months apart with return of the 'principal' (capital) on the maturity date.

Entities with projects could then apply for funds to invest in low carbon projects. The debt could be securitised against the probability of a refinancing when credit market conditions improve and revenue streams accruing from policy mechanisms like an energy efficiency household levy.

A retail offering of fixed-income products was also suggested, perhaps as 5-year 'notes' (short-term gilts) with an attractive yield, perhaps 4% compared to <1% from instant access savings schemes currently. This could either be a generic issue for low carbon technology or specific to fund a particular technology programme.

It was also proposed that the Government create a UK "Green Investment Bank" with the capacity to catalyse (rather than crowd-out) private sector investment through the use public finance to implement low carbon infrastructure investment, using a variety of public/private finance approaches. The new Bank would manage bond offerings.

A role for retail Climate Bonds?

There has been some comment that the scale of public concern about climate change could mean there would be retail interest in Climate Bonds as this generation's War Bonds.

This is an untested hypothesis; and some argue that even the most successful fund-raising is, by itself, likely to be modest compared to the need.

However, there may be significant ancillary marketing benefit in promoting retail Climate Bonds.

It would help build support for a substantial project to address climate change, at a time when disappointment about Copenhagen negotiations is likely to be realised; and it may draw attention to the constructive role of participating financial institutions, as a time when public confidence in those institutions needs bolstering.

"Environment" bonds from Climate Change Capital

Separate to the UK Government submissions, James Cameron of Climate Change Capital has been arguing in speeches and articles for the creation by governments of "environment bonds" similar to bonds created to fund efforts to fight World War II. He believes this would be a straightforward way to raise money to develop clean technology and build low-carbon economies.

The bonds would be designed to support the introduction of new technologies and infrastructure over long time horizons, unlike investments that demand quick shareholder returns. "Returns do come right away — it is a bond with fixed returns — but they will not make you rich quick," he said.

Because the bonds would offer secure returns, they should appeal to citizens and investors disillusioned by the implosion of the banking sector and worried by the grim economic outlook, according to Mr. Cameron. Additionally, the bonds could tap a vein of renewed idealism among investors who are seeking to use financial system for good causes.

"I sense that there is now will for people to put their money to productive use," Mr. Cameron said. "There is something powerful in the idea that, 'My money built that and it works and I use it.' Building things for a purpose that binds investor, worker, user – and society – is a noble cause."

Developing country-issued bond with carbon credit repayments, from UNFCCC

Proposed by UNFCCC's Yvo de Boer. Developing countries would issue bonds to capital markets. Investors receive returns in the form of carbon emissions when bonds mature (under whatever scheme emerges after 2012). Bonds are guaranteed by issuing governments. Developing governments have an

incentive to develop national emission targets (for example, to 2020) to guide investors on the volume of carbon emissions expected. It would depend on a future carbon market and international agreement, which is not secure and could be regarded as high risk.

Similar to future-flow securitization which has been proposed in Sub-Saharan Africa. Borrower typically pledges future foreign-currency receivables such as oil, remittances, credit card receivables, etc (Ketkar and Ratha 2005).

This proposal hasn't been priced as of yet.

Independent agent issued bonds with donor country repayments , from EU

Proposed by European Commission, for climate change related projects in the form of the EU Global Climate Financing Facility.

An independent finance facility would issue bonds to the international capital markets against legally binding pledges for future repayment of overseas development aid from donor (developed) countries.

It is envisaged payback guarantees would also include revenue generated through the carbon market, airlines taxes etc. This is described as front-loaded financing because capital is delivered up front and repaid over time.

The UK proposed the International Finance Facility in 2003 to meet the Millennium Development Goals by 2015. It would seek annual commitments of US$15-16billion such that it would issue bonds in its own name and seek repayments from donor countries to 2030.

The EU"s Global Climate Financing Facility could raise between EUR500 million and EUR1 billion annually.

This concept has been used in the recent International Finance Facility for Immunisation. IFFI has anticipated raising USD4 billion over the next 20 years.

Existing financing vehicles from Multi-lateral Development Banks

World Bank:

- Climate Investment Funds (US$ 4.5 billion).
- Carbon finance (US$1.8 billion).
- Global Environment Facility (US$ 3.13 billion).

Asian Development Bank:

- Clean Energy Financing Partnership Facility and carbon Future Fund (US$2.2 billion).

European bank for Reconstruction and Development:

- Sustainable Energy Initiative (€1.5 billion).

European Investment Bank:

- Climate Change Financing Facility and Risk Sharing Finance Facility (US$ 2.2 billion).

Multilateral Climate Change Fund and a Venture Capital Fund

These were proposed by various member states at the second session of the AWG-LCA.

These funds would be administered as new subsidiary bodies under the Conference of Parties to the UNFCCC.

Amongst the specific priorities of these institutions, China and India have emphasised the importance of venture capital to target new and promising technologies which have not been taken to market.

Parties have also argued in favour of fast-tracking the development of certain renewable energy technologies (UNFCCC, 2007).

Brazilian Government-led trillion-dollar Climate Mitigation Investment Fund.

Marc Weiss of the Global Urban Development Network (and regular Tomorrow's Company guest speaker) reports that a multi-country group has begun work on a "Global Climate Prosperity Agreement" proposal, a variation of the Multilateral Climate Change Fund. A planning meeting is planned for late July in Brazil. Awaiting further details.

The aim is for a group of national government leaders and private sector investment executives will announce this voluntary, market-oriented, public-private investment and development strategy in Copenhagen in December 2009 as part of the United Nations Framework Convention on Climate Change.

It will involve consortium of public and private pension funds and other private financing institutions committing to invest one trillion dollars in developing countries over the next decade to build a renewable energy infrastructure, including support for plug-in electric vehicles and a "smart" electric grid. Governments will be expected to provide additional funds, tax incentives, and regulatory policy support.

Innovation diffusion centres proposal, from UK Carbon Trust

The UK Carbon Trust advocates a new international institutional arrangement involving five centres coordinated under a single umbrella organisation. These centres would focus, among other things, on incubating and accelerating new technologies which are yet to be commercialised by testing their commercial and technical viability.

Emphasis would be placed on providing business development skills to new business start-ups in developing countries, and investing more funding in applied R&D. The expected funding required for these five centres is between USD 1 billion to USD 2.5 billion in total over the next five years. This model is based on the Carbon Trust's current operations within the UK.

A similar model for so-called 'distributed innovation centres' has been proposed by the Clean Energy Group, where the umbrella organisation would be an international institution like the World Bank or a UN agency.

The World Bank's proposed Clean Energy Financing Vehicle

The World Bank has proposed the need for a Clean Energy Financing Vehicle to fill the gap in financing of nearly USD 10-15 billion annually.

The Vehicle would envisage receiving funding from G8 and G+5 countries and would be an independent entity managed under an existing MDB.

Amongst the Vehicle's priorities would be finance and support for commercialisation of new technologies, and to mitigate technology risk faced by private sector financiers.

London, 30 April, *Environmental Finance*:

A third World Bank climate bond issue is in the wings from the Swedish bank that has placed the previous two issues. And European investors are planning to buy further bonds once the currently high costs of swapping dollars with euros have fallen, according to Christopher Flensborg, a coordinator in SEB's capital markets team.

On Friday, Swedish bank SEB announced that California had bought $300 million of the three-year bonds, the proceeds of which will be hypothecated for projects in developing countries that tackle climate change. This follows a first placement in November last year, of $300 million of Swedish krona denominated bonds with Scandinavian institutional investors, also managed by SEB.

SEB will be back in the market with a third bond in four to six weeks, which will also be dollar denominated. It's expected that this issue will go to 15-17 investors, and be of a similar size to the California placement.

Flensborg added that "a number of large European institutions" are interested in participating. However, because the World Bank issues its debt in dollars, the proceeds typically need to be swapped into euros for European investors – and current swap market conditions make this unattractive. He declined to comment on the yield paid by the California bond, as it was a private placement. The first bond paid 0.25% above Swedish government bonds.

These climate bonds are the first time that the World Bank has ringfenced part of the proceeds of its fundraising for a specific purpose. The programme was developed in response to investor demand, including – but not exclusively from – socially responsible investors, the bank said.

Further reading

- OECD Discussion Paper: "What Role for Public Finance in International Climate Change Mitigation", by Richard Doornbosch and Eric Knight. Prepared 2009 for the OECD Round Table on Sustainable Development. http://www.oecd.org/dataoecd/20/26/41564226.pdf
- "Global Development Bonds", by Michael Eckhart and John E. Mullen, October 2004. International Working Group of the Energy Future Coalition. http://www.wbcsd.org/web/projects/sl/gdb.pdf
- "Forest-Backed Bonds Proof of Concept Study", July 2007. Prepared by Forum for the Future and EnviroMarket for IFC and DfID.

Further work?

Developing requirements of effective Climate Bonds proposals?

What criteria should we use to assess whether different non-government financing proposals will address the necessary scale and speed of global re-industrialisation?

For example:

- Be able to leverage a wide variety of projects, from municipal to multi-national scale.
- Be able to operate over multiple-decades.
- Provide a high level of security for investors.
- Independent project compliance verification/auditing.
- Work with different timeframes for returns (short for energy efficiency (EE), long for renewables).
- Have international application.
- Support international liquidity for investors.
- Support investments in developing countries as well as developed.

Areas of further discussion?

1. Financial instruments — A range of options exist for financing instruments. The finance community could play a central role in developing clarity around preferred investment instruments that meet the combined needs of investor security and the scalability required.
2. Government enablement: reducing transaction costs and risk factors. — Virtually all large-scale projects will have a need for *enabling support* by governments, as distinct from direct support. In some of the proposals below governments would be called on to guarantee feed-in tariffs, or to fully or selectively provide guarantees for projects.

   Richer nations might be called on to fund, as per existing World Bank schemes, part guarantees for riskier developing nation projects.

   A range of other roles will be just as critical, from streamlining approvals processes and cutting red tape generally to removing distortionary policies (such as hidden fossil fuel subsidies) that work against new projects and strategically using public procurement (as the US Defence Department has for many years).

   Finally, international institutions are likely to be called on to support systems for investor-credible verification and validation, especially for developing country projects.
3. Industry mobilisation, in particular project packaging and development — As ABP's Rob Lake has commented, there's a lack of packaging for appropriate scale and due diligence requirements.

To find out more about further discussions, contact NSFM Climate Change Working Group co-chair, Sean Kidney, sean@seankidney.com