Carbon Initiative for Development

METHODOLOGY WORK PROGRAM

FY 2015

The Carbon Initiative for Development (Ci-Dev) aims to utilize the Clean Development Mechanism (CDM) to implement household energy access projects in low income countries, with a focus on Africa. If the Ci-Dev is successful it could establish a new type of business to incentivize investments in high development benefit projects in the poorest countries. This objective is reinforced by Ci-Dev's intent to catalyze a self-sustaining private sector driven business that continues after the withdrawal of Ci-Dev intervention.

In order to reach its objectives, Ci-Dev needs to invest strategically in business model innovation. Thus, it requires a sound understanding of experiences made and lessons learned – within and outside the CDM (i.e., with and without carbon finance). It also requires new ways of integrating the CDM into project finance (i.e. financial innovation and cooperation with the relevant financial institutions).

A detailed knowledge management and sharing program will be developed during FY15 and implemented from FY16 on. It will disseminate the lessons learned from the development of various Ci-Dev pipeline programs, the application of improved CDM methodologies and procedures, and the management of CDM POAs. It will also include the dissemination of best practices on business models and project finance.

Integrating carbon finance in traditional financing – key barriers and existing experiences

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Objective:

The objective of this note is to identify/assess the barriers preventing local financial institutions from utilizing carbon finance to support their financing activities, and to summarize existing attempts in using carbon revenues to enhance the bankability of these projects by reducing risks. The note is a deliverable under the Carbon Initiative for Development's (Ci-Dev's) Methodology Work Program for FY15 supporting the Ci Dev achieve its objective of utilizing the Clean Development Mechanism (CDM) to spur the implementation of projects in low income countries, to the extent possible, with a focus on household energy access on Africa.

Context:

The CDM has been an important catalyst of low-carbon investment in developing countries. By complementing and leveraging other resources, it has catalyzed the shift of much larger amounts of (essentially private) financial and investment flows toward climate-smart development. The WB estimates that during 2002-12, about 2.4 billion Certified Emission Reductions (CERs) worth US$28 billion were contracted forward from projects. If all of these projects were implemented, the CDM would have leveraged an additional US$130 billion in low-carbon investment, primarily in clean energy, to developing countries. In comparison, global new investment in renewable energy in developing countries totaled approximately US$490 billion over the same period.

Additional revenues from carbon finance enhance the overall financial viability of low-carbon projects. As performance-based payments, these revenues create a positive incentive for good management and operational practices that will sustain emission reductions over time. In addition, to-date almost 8,000 projects in more than 100 countries are reducing over 1.5 billion tons of CO2 equivalent.[1]

Barriers to local financial institutions' utilizing carbon finance to support financing of projects

The large number of CDM projects and issued CERs may overemphasize the global results, yet underestimates the substantial skewed impact of carbon finance to certain types of technologies and countries. For example, to-date about 88% of all issued CERs come from four of the largest emerging economies (China, India, Brazil, and South Korea), while least developed countries (LDCs) respond for 0.2% of the CERs available to-date.[2]

Poor countries face significant investment barriers associated with the scarcity in long-term capital available for project implementation and the critical need of an enabling host country's business environment for a successful (and sustainable) investment implementation at project level. Securing sources of funding – both equity and debt finance – sufficient to meet capital investment needs has proven to be a major constraint in advancing projects.[3] Energy access projects face additional challenges. Their commonly small size, high project development or start-up costs and transaction risks create

[1] Source: UNEP Risø Centre, 1 December 2014
[2] Source: UNEP Risø Centre, 1 December 2014
[3] Long-term finance from local financial institutions is inadequate and often costly. Even for qualified entrepreneurs, the high cost and stringent commercial conditions of available loans e.g., high interest rates and fees, short tenors, strong guarantee and collateral requirements, and stringent covenants, frequently do not match project needs and often become unsustainable. Access to international funding can be an even greater challenge, particularly for the poorest countries where risky business environments and economic instability discourage private sector investment.

market barriers. As a result, in addition to the lack of access to credit on reasonable terms, in many cases project developers have to subsidize output prices for competing with cheaper thermal power plants and fossil fuels energy sources (i.e., kerosene).

At the same time, carbon credits are not designed to directly address the capital investment needs as payments for emission reductions are mostly available upon project's completion and operation only.[4] In addition, the lack of long term mitigation signals in the international dialogue on climate change and the uncertainties regarding the future eligibility of international carbon credits in existing and emerging schemes led to a substantial decline of carbon prices in recent years. The value of CERs has reduced from levels higher than €20 in 2008 to €0.04.[5] Under this scenario, most market players have exited the market, particularly those from the financial sector who could no longer find opportunities to justify the maintenance of a designated carbon business line and personnel.

All said, the experience shows that, unable to overcome some of the sectoral and geographical investment barriers faced by underlying projects under current conditions, to-date carbon finance has made investments with already relatively low-risk investments and with marginal rates of return, somehow more attractive and profitable, thus enhancing their chances of being developed and remaining operational.[6]

Existing experience on financial products and structures:

Several financial products and structures were identified that use carbon finance, however the form in which they support financing of CDM projects varies significantly. As background information, this note provides a review of literature that summarizes real experiences in applying these different financial structures and then, makes recommendations based on the review of the different products and structures in terms of their ability to incentivize new investments.

The financial products and structures identified can be categorized into seven categories as follows:

1) Frontloading of future carbon revenues;
2) Project finance / structured commodity finance / Monetization of the future ERPA receivables;
3) Bundling;
4) Layering / Syndication;
5) Options and Derivatives;
6) Insurance / guarantee; and
7) Issuance of bonds.

See below an explanation for each one of these categories.

[4] In addition to structural risks, CERs are deemed as risky assets to many investors given the high uncertainty of actual CER generation (in comparison to early estimates in PDDs), mainly due to CDM complex procedures, as well as technical and regulatory uncertainties.
[5] Source: ICE, ICE ECX CER Emission Futures - ECX CER - 4 December 2014 (registration required).
http://data.theice.com/ViewData/EndOfDay/FuturesReport.aspx
[6] Source: Kossoy, Alexandre and Ambrosi, Philippe; State & Trends of the Carbon Market 2010 report; World Bank; 2010.

1. Frontloading of future carbon revenues: As noted above, carbon finance does not naturally address capital investment needs and requires a financial structure to frontload payments for emission reductions to enable it to contribute to project financing. The following instruments use carbon flows to provide upfront financing.

   1.1. Advance payments / supplier's credit: There have been some advance payments in the market. However, the vast majority of buyers of carbon credits purchase these assets to comply with their emission reductions obligation targets. Most of them are either unprepared or unwilling to assume the investment risks in the underlying CDM project. Therefore, historic advance payments have been limited to up to 25% of the nominal value of the future Emission Reductions Purchase Agreement – ERPAs value. The Climate and Carbon Finance Unit of the WBG, working as Trustee of several carbon funds and facilities has several cases where advance payments were provided to project developers to help them build equity to cover project investment expenses, or for them to conduct methodological and regulatory work related to the carbon asset creation. Most cases limit such advance payments to the limit of 25% of the nominal value of the ERPA. In addition to this limit risk assessments of projects that identified if a project was high risk or less creditworthy, additional guarantees have been sought. These additional guarantees could be in the form of letter of credits (LCs) / guarantees from international financial institutions (i.e., mainly when dealing with private sector counterparts) or official promissory notes (mainly when dealing with public sector counterparts). However, experience indicates that it is extremely difficult for project developers / sellers of CERs to provide such guarantees. Commonly, they do not comply with LC issuers' investment criteria and thus, they cannot obtain LCs acceptable to the buyers.[7] At the same time, from the seller's perspective such guarantees can be quite expensive, significantly reducing the benefit of the advance payment (if such guarantees can be provided, a regular loan instead of an advance payment could be also provided and the advance payment becomes much less attractive to the seller). In addition, for several CDM technologies, the Net Present Value – NPV of future carbon finance revenues already represent a small fraction – commonly between 5-10% – of the underlying CDM project's capital investment needs.[8] Thus, advance payments of CDM revenues – as a fraction of a fraction of underlying project investments – provides limited support in leveraging additional investments and leading to the project's financial closure. Still, several examples show that when project developers can secure other sources of equity to complement the advance payment and reach at least 15-20% of the project's capital needs, chances to attract debt finance from local and international financial institutions increase substantially.

   1.2. Energy Service Companies – ESCOs: This can be seen as a variation of the supplier's credit. An ESCO is a commercial or non-profit business that identifies, implements, finances and delivers energy investments in client installations for a fee. The investments typically yield energy savings, and the fee is usually delivered in the form of the right to receive a share of the savings and, in some cases, carbon and/or tax credits.[9] The ESCO model delivers savings to the client without requiring upfront investment by the client; however, it does require the ESCO to secure upfront financing, either on its own balance sheet or off-balance-sheet

[7] Buyers have sought irrevocable LCs, covering the full- hard currency – amount anticipated, valid for the entire ERPA period, and to be provided by reputable, investment grade (BBB or above) financial institutions.

[8] Exceptions to this include solid waste and some energy efficiency technologies.

[9] The ESCO performs an analysis of the installation, designs a solution, installs the required elements, and maintains the system to ensure energy savings during the payback period. The savings in energy costs are typically used to pay back the capital investment of the project.

through arrangements with others, such as equipment suppliers, government agencies or parent companies. In that context, carbon finance can also be frontloaded by ESCOs to project developers as a variation of the supplier's credit example above. For instance, the Thailand's ESCO Fund was established under the Ministry of Energy with grant support from the government's Energy Conservation Promotion Fund. The ESCO Fund supports energy efficiency and renewable energy projects through various channels, including equity investments, venture capital, equipment leasing, carbon markets, technical assistance and credit guarantee facilities, providing up to 50 % of total equity. In the case of very small projects, it will provide support through equipment leasing. It also helps its clients and investors sell CERs on the international carbon market.[10] Confirming the investment barriers described above, the need to secure financing is one factor that has limited the widespread development of the ESCO model, particularly in developing countries where potential ESCOs may have limited access to financing. Two other potential schemes following this same approach and worth the reference are:

- Angaza Design[11] uses an ESCO model to finance pay-as-you-go schemes for solar lamps. Using proprietary software that enables communication with their Energy Hub, clients can make payments through different mobile money systems across multiple countries. The Energy Hub also monitors units sold by dealer or region, as well as energy usage and payment patterns, which could provide data required for CDM monitoring and verification. This, in turn, could potentially deliver CDM revenues to defray investment costs.

- Under the World Bank Group's Lighting Africa initiative, the Public-Private Infrastructure Advisory Facility co-funded the market-based delivery of off-grid lighting services and products. In Rwanda, the program introduced 8,000 LED lights to rural households and businesses, displacing kerosene. Sales of these lights after the program were growing by 20% a month. As above, CDM revenues could enhance the viability of this business model.

2. Project finance / Structured commodity finance / Monetization of the future ERPA receivables: The first monetization structured as project finance (e.g., with no direct recourses against the borrower) was reported in 2001 in a deal between the WB and Rabobank. In that structure, the WB (as trustee of the Prototype Carbon Fund) indicated its interest to purchase the CERs to be generated by a CDM project in Brazil (Plantar). However, the project developers did not have the financial resources necessary to implement the project. Thus, Rabobank agreed to anticipate the exact nominal value of the ERPA between the WB and Plantar in the form of a loan to Plantar (i.e., Plantar was both the borrower of the loan provided by Rabobank and the seller of the emission reductions to the WB). The fact that the WB was paying for the CERs in hard-currency and directly to Rabobank's account outside Brazil substantially reduced the lender's perceived risks in the transaction, allowing Rabobank to proceed with the project finance. In addition, the repayment schedule of the loan was structured in order to mirror the expected proceeds from the ERPA enabling the WB to purchase the CERs while fully amortizing the loan. All the above

[10] Source: Industrial Efficiency Policy Database, "TH-7: The ESCO Fund," accessed at http://iepd.iipnetwork.org/policy/esco-fund
[11] http://www.angazadesign.com

significantly reduced the lender's own transaction expenses[12] and Rabobank reverted the benefit to Plantar, who received the funding at below-market conditions.

2.1. In a slightly different approach from the one above, the International Finance Corporation (IFC), the private sector arm of the WBG, also offers monetization of future cash flows from sales of carbon credits combined with structured financing. Under this approach, IFC lends against ERPAs for CERs signed with itself (as off-taker) or creditworthy third parties, typically in the form of mezzanine and/or equity financing to the project or its parent company. Tenor and repayment profile are matched with the CER revenue streams. By monetizing firm carbon offtake agreements—and leveraging its ability to assume and manage long-term emerging-market project and credit risk – IFC helps projects reach financial closure. It is exploring financing very small and dispersed energy-efficiency projects through the new programmatic approach under the CDM, starting with a CFL program in India. The programmatic approach could potentially be replicated for energy access and distributed generation programs.

There have been a few subsequent transactions reported in the market along the lines described above, mainly in 2009-2010. However, the risks involved in the regulatory CDM process, the – lack-of-demand-driven – substantial decline in market conditions from 2011-2012 on and the uncertainty regarding the future of CDM, resulted in reduced activities by most financial institutions. Under today's market conditions, with limited private sector activities in carbon markets, certain public sector donors and institutional investors have increased their engagement in CDM projects with the clear objectives of avoiding the complete dismantling of the technical and structural infrastructure hardly crafted over a decade.

2.2. Public sector (grant) funding e.g., from donor countries have been used to provide early stage funding to projects and programs of activities (PoA)s. The disbursements / payments are repaid with initial CER vintages generated by the projects and, in the absence of these buyers' compliance obligations, CERs would be cancelled or retired – while the GHG net mitigation value is preserved. The donor takes the initial investment risks, to a great extent unbearable to private sector investors seeking financially sound return-to-risk-ratios in their investment decisions. Once the largest investment barriers are removed and the project is up and running, the long term sustainability could be ensured by private sector (or other) investors / buyers of the remaining CERs over a longer period. At the same time this structure is more financially attractive to private sector investors, the advantage for the public sector donors would be the relatively high leverage of scarce public funds available with private sector money. The latter has become more and more important in public development finance and carbon finance can provide an excellent platform for that purpose.

2.3. Concessional funding, notably from the Global Environment Facility (GEF), has also been used to support structured finance solutions. Typically, funds from GEF (and other donors) provide an equity cushion. For example, the GEF and other donors placed $29.5 million (including $4.5 m from GEF) in AfDB's Africa Renewable Equity Fund as "Class A" shares, whose return is capped at 4%. The capped return on the A shares would increase net returns to other investors by 2-3%, which will increase the potential pipeline of

[12] The transaction was deemed as country / sovereign risk free. Thus, Rabobank did not have to seek a sovereign insurance/guarantee in the market, thus increasing its margin.

projects attracting commercial lenders and thus, reduce the need for other types of donor or tariff support. The GEF and donor investment has been used as seed funding to attract $150 million of funding from partners. "Another example is IADB's MIF Public-Private Partnership Program, which is funded by a US$15 million GEF equity investment and expects to raise more than $260 million in targeted equity investments in funds to promote climate-friendly investment in Latin America. The GEF funding will be used along with IADB funding and other investor funding to help projects "get to close" and begin implementation."[13] Although, to-date no particular carbon finance project was identified under these structures, under the same model, carbon finance could in theory increase the investors' return and, could therefore increase the attractiveness of an investment as well as the leverage of the concessional funding.

2.4. The new Electrification Financing Initiative (ElectriFI) created by the European Commission aims to accelerate access to (rural) energy in developing countries by boosting private sector to yield business opportunities. Past efforts supporting rural electrification were predominantly grant-based and therefore not generating a leverage that would allow reaching the ambitious policy objectives, whilst the sustainability of projects was not optimal. Unlike past support initiatives, the ElectriFI proposal is based on the assessment of (i) existing market imperfections and failures leading to sub-optimal investment situations and (ii) the investment needs and alternatives in terms of financial support such as grants, equity, loan and subordinated debt. The structure uses convertible bonds into subordinated debt, where subordinated debt qualifies as equity for senior debt lenders as long as repayment is from cash flows otherwise available for dividends and default rights are predominantly exclusive with senior lenders. Given the nature of the projects aimed, synergies with carbon finance component will be pursued and, like the items 2.1 and 2.2 above, the situation potentially creates a win-win scenario where the underlying project naturally benefits from the future revenue streams from carbon finance, while the latter can be monetized – and eventually frontloaded.

3. Bundling: The ability to achieve economies of scale is critical in reaching financial viability in distributed-generation /energy access investments. In addition to the well-known elevated costs related to the CDM asset creation (i.e., the processes required for the project to comply with the eligibility criteria under the existing regulatory frameworks and for the CERs to be issued), the perceived high risks inherent to the trade of a political commodity led – mainly private sector EU-ETS compliance – buyers to over-protect themselves in CDM-related transactions. The costs associated with the regulatory, sectoral, and project-related due-diligence, and the preparation of legal documentation until the signature of ERPAs increased asset creation costs. These costs were so inflated that they dramatically reduced – and for small projects generating few ERs, even offset – the overall carbon finance contribution. To reduce these risks, some buyers preferred to purchase primary CERs from aggregators, intermediaries and/or large sellers with a portfolio of two or more projects. In that case, the under-delivery in one project could be compensated by the over delivery / surplus of another. In addition, this practice proved helpful for operational and management purposes. Programmatic CDM further reduces costs and facilitates bundling. In fact, similar bundling advantages can be obtained with Program of Activities (PoAs). However, if certain risks are

[13] Source: Global Environment Facility, "GEF-6 Non-Grant Instrument Pilot and Updated Policy for Non-Grant Instruments," October 10, 2014, p21. http://www.thegef.org/gef/sites/thegef.org/files/documents/16_EN_GEF%20C%2047%2006_GEF-6_Non-Grant_Instrument_Pilot_and_Updated_Policy_for_Non-Grant_Instruments.pdf

indeed reduced in PoAs, ground-level experience shows that financiers are often reluctant to finance PoAs due to other expanded inherent risks e.g. dispersed and heterogeneous group of project developers, multiple purchasers for different CPAs, primarily small scale activities with high administrative costs, difficult acceptance / proper maintenance of new technologies by some unsophisticated project developers, projects often undertaken in high sovereign risk countries, etc.

4. Layering / Syndication: Buyers purchased carbon credits to comply with their ER obligations and, given the several risks related to the registration of the underlying project, certification of the credit, and the credit's eligibility across different compliance markets,[14] buyers were reluctant in bearing the risk of concentrating all their carbon credits sources in a single or very few projects. At the same time, buying a portion of the credits generated by the projects did not make commercial sense given the fixed costs associated with the transaction regardless of the amount of carbon credits generated. Thus, with the support of financial institutions, aggregators and /or intermediaries, some buyers managed to diversify their risks by syndicating the purchase of credits among different buyers. The structures included a *Pari Pasu* transfer of credits among the pool of buyers or delivering the credits in layers (i.e., credits would be initially delivered to "senior" buyers before "junior" buyers would start receiving theirs). The latter was adopted when different buyers were prepared to bear different types and levels of risks e.g., sovereign vs. private sector buyers, and buyers more or less willing to bear eligibility risks for international credits under the EU market). Different delivery schedules could also imply different commercial terms and conditions. Seen as a hedging option for buyers, moving forward, hedging models could be explored.

5. Options and Derivatives:[15] Several are the financial derivatives introduced by the market players, including financial institutions to support their trading strategies and/or risk management, or players seeking arbitrage gains in a market booming in size and sophistication until 2009-2010, before the economic downturn in the EU-zone led to the substantial decline in the market size and level of private-sector engagement. At the same time, public sector participants have experimented with derivative structures to highlight innovative financial opportunities to incorporate carbon finance into traditional finance to maximize their impact and raise awareness. Although derivatives do not have a direct impact on project funding, they do address / mitigate risks considered unbearable by financiers. Therefore they can ultimately help increasing the traditional financiers' appetite to invest in those projects. Thus, we see merit in including them in this note. Derivatives include, but are not limited to:

    5.1. The purchase of call options ("calls"), by buyers with compliance needs, CER sellers in the secondary market that were short for delivery, and market players that were bullish on prices or were simply using options as part of larger trading strategies (i.e., collars, strangles, straddles, volatility trades, relative value trades and inter-asset trades). To illustrate this, the well-known delay and shortfall in the issuance of CERs (particularly until 2010, when most buyers were actively seeking credits) left sellers in the secondary market continuously in a short position to be rolled forward. In other words, due to the underdelivery of projects the sCER sellers, including intermediaries and aggregators, did not have enough CERs to honor their delivery obligations and were forced to buy CERs on the spot market – that explains the constant "backwardation"[16] witnessed in the

[14] A classic example is the eligibility criteria introduced by the EU-ETS on certain types of CERs and ERUs during its Phases II and III.
[15] Source: Kossoy, Alexandre and Ambrosi, Philippe; State & Trends of the Carbon Market 2010 report; World Bank; 2010.
[16] Backwardation is a term used in the futures market to describe a downward sloping forward curve (i.e., futures prices are below spot prices). Antonym: contango.

CER price curves. The practice of purchasing CERs at the last minute commonly led to a loss (i.e., the loss occurred when prevailing prices were higher than they were when the sellers sold the CERs forward). To manage against this risk sellers increasingly chose to buy call options instead – which became the most common derivative in the market.[17]

5.2. The sale of calls by players that were long – a so-called "soft hedge" – as the upfront premium obtained from the sale of the calls reduced the downside price risk, as well as players that were bearish on future prices.

5.3. The purchase of put options ("puts") by "long" compliance buyers (entities that were overallocated), project developers who only committed a portion of their offsets in ERPAs, financials or intermediaries that purchased offsets at fixed prices and wanted to lock in profit and project asset value, and players that were bearish on future prices.

5.4. The sale of puts by entities that were "short" for compliance – a so-called "soft long" – since the premium from the sale of puts helped to reduce the cost of compliance for installations vis-à-vis the purchase of calls, as well as by players with bullish views (they would not get exercised if correct on future prices, but would still collect the premium).

5.5. Highlighting the use of derivatives for development objectives, the Pilot Auction Facility for Methane and Climate Change Mitigation (PAF) is being designed by the World Bank. It seeks to pioneer the use of auctions and put options to allocate scarce public finance to address climate change mitigation in an efficient manner. The put options, sold by the PAF via an online auction, will provide a price guarantee to emission reduction project developers for the sale of their future credits giving them the confidence to invest in climate-friendly projects. The project developer holding the put option keeps the rights to sell the emission reductions in the market if prices rise in the future, but he can exercise the put option – and sell the emission reductions at the agreed fixed price – to the PAF if future market prices are lower than the price under the put option. Also, the put options will be tradable, which means, for example, that if the buyer of the put option has a project that is not generating the volume of carbon credits anticipated, the holder can sell the put option to another developer who thinks his project will generate eligible emission reductions. This tradability from one option holder to another maximizes the likelihood that the PAF will achieve its full potential to reduce emissions.[18]

6. Insurance / guarantee: private sector lenders and investors are not well equipped – thus not willing – to cover sovereign and regulatory risks, intrinsic to international policies such as the in Kyoto Protocol's CDM projects. There is general understanding that combined efforts from government agencies, multilateral development banks, international financial institutions and insurers/re-insurers might be required in order to create a sustainable business environment, enabling the deployment of existing commercially unattractive low-carbon technologies and the development of new ones. Underwriting political and regulatory risks, as well as the contract-frustration

[17] "In 2009, 56% of the 91 million tons of CER options transacted were calls". In addition, the strike price of calls (which provide upside risk insurance if prices go up) were higher due to the large amount of collars transacted.
[18] The PAF is backed by several government donors and has a capitalization target of $100 million. In a first phase, it will support projects that cut methane emissions at landfill, animal waste, and wastewater sites facing low carbon prices.
http://www.worldbank.org/en/topic/climatechange/brief/pilot-auction-facility-methane-climate-mitigation,
http://www.worldbank.org/content/dam/Worldbank/document/Climate/pilot_auction_facility_brochure_wbg.pdf.

risk at country and sector levels have proven necessary for several deals to move forward. However, few are the successful cases being identified. Among them, in 2006 the Multilateral Investment Guarantee Agency of the World Bank Group (MIGA) provided it's first-ever support for a CDM project. MIGA supported the solid waste landfill project in El Salvador by providing $2 million in guarantee coverage (insurance) to a Canadian private company (Biothermica Energy Inc). The guarantees covered the risks of: (i) expropriation of assets, including administrative/regulatory decisions that could indirectly cause a reduction in waste quantities delivered to the landfill covered under expropriation coverage, (ii) war and civil disturbance – and physical damage to the asset, including the inability of auditors to enter the project site due to politically motivated violence, and (iii) breach of contract, including the breach of the Salvadoran government's obligations under the Letter of Approval by withdrawing from the KP, resulting in the loss of CERs. On the other hand, MIGA was unable to cover risk of non-renewal of the Kyoto Protocol.

6.1. Carbon delivery guarantee (CDG): Under this instrument, a financial intermediary assures the delivery of carbon credits from projects in developing countries, leveraging its own creditworthiness to reduce carbon delivery risk to the buyer, thus obtaining a higher price to the seller. The IFC, acting as an intermediary, has completed three CDG transactions since 2008 for 2.2 million CERs to buyers based in industrialized countries.[19] Under this structure, IFC guarantees the delivery of EU-ETS-quality CERs to buyers, fully mitigating credit, country/sovereign and regulatory risks. In addition, IFC provides buyers with comfort of associating with an IFI with high environmental, social and governance performance standards. Given the high creditworthiness of the ERPA with IFC, it has better chances of being monetized to raise financing.

6.2. Other risk-sharing instruments: IFC has established a series of bilateral loss-sharing agreements with project developers and asset originators (financial institutions and companies), in which the IFC reimburses the originator for a portion of principal losses incurred on a portfolio of eligible assets, beyond an agreed threshold (i.e., first-loss). This allows the originator, with IFC's help, to introduce new products or to target new consumer or business segments.[20] It also enabled concessional funding, notably from the GEF, to provide first-loss cover. "Starting from a GEF project with the IFC in Hungary, the GEF and the IFC eventually went on to launch 12 sustainable energy finance programs supported with concessional funding. An additional three were subsequently established without GEF funding, based on the GEF model."[21] Whereas these first-loss facilities have been used primarily to support local bank lending for energy efficiency investments, the model could be replicated to support energy access and distributed generation, notably through microfinance institutions.[22]

7. Issuance of bonds: "Green bonds are a type of infrastructure bond that provides debt to a project or a portfolio of projects that are certified as being environmental or "green". The green character is the key enhancement over infrastructure bonds. By being green, these bonds may be able to access ethically minded investors who may have

[19] Rain CII Carbon Ltd. (India, 2007): 850,000 CERs from Waste heat recovery;
Omnia Fertilizer (S. Africa, 2008): 900,000 CERs fromN20 destruction;
Him adri Chemicals & Industries (India, 2009): 460,000 CERs from Waste heat recovery
[20] http://www.ifc.org/wps/wcm/connect/1d022f00487c8d409ca4bd84d70e82a9/Risk+Sharing+Facilities.pdf?MOD=AJPERES
[21] Source: Global Environment Facility, "GEF-6 Non-Grant Instrument Pilot and Updated Policy for Non-Grant Instruments," October 10, 2014, p. 21. http://www.thegef.org/gef/sites/thegef.org/files/documents/16_EN_GEF%20C%2047%2006_GEF-6_Non-Grant_Instrument_Pilot_and_Updated_Policy_for_Non-Grant_Instruments.pdf
[22] USAID, "Using Microfinance to Expand Access to Energy Services," November 2007. http://pdf.usaid.gov/pdf_docs/PNADM641.pdf

a preference for green investments or have restrictions or limitations to non-green investments when debt is scarce. By creating a distinct market and through competitive forces, green bonds could lower the cost of environmental infrastructure projects. Corporations and governments have also issued green bonds to back low-carbon projects, using their institutional creditworthiness to bring down financing costs for the projects."[23] Although the issuance of green and climate-related bonds quickly expanded in the last years, there are few issuances of carbon-linked bonds. In principle, these products use the capital raised by selling the bond to either invest in the development of projects generating carbon credits or purchase call options for carbon credits in different projects. The interest rate to be paid to bond holders (i.e., coupon of the bond) could come from the upside of future carbon prices until the bond matures, and would be shared between the issuer and the buyers of the bonds. Among the few examples, the World Bank Cool Bonds were issued in two transactions, June and September 2008, and totaling $31.5 million. The 5-year, USD-denominated notes pay a coupon of 3% for an initial period, and a variable coupon amount for the remaining maturity of the notes tied to CERs generated by specified GHG-reducing projects in China and Malaysia. IBRD counterparties' hedging their exposure to CERs contributes to expand this market as well. Daiwa Securities and Mitsubishi UFJ Securities distributed the notes to Japanese investors. Proceeds were not dedicated to a specific purpose.[24] While recognizing that further analysis and conceptual upgrading on bonds is needed, to-date these products have been primarily suitable for larger institutional and financial players in capital markets, and to-date their use in primary market players has been very limited.

Key findings and suggestions:

Some key findings from the existing experience are:

- In order for carbon finance to be considered in project finance and support investments in poor countries, carbon finance needs to be dramatically scaled-up to overcome the existing investment barriers.[25]Although this is necessary for a permanent solution, it may not be necessary for strategic contributions, at the project level, which is the main objective of this note.

- Financial products 1 – Frontloading of future carbon revenues, 2 – Project finance / structured commodity finance / Monetization of the future ERPA receivables, and 3 – Bundling: while monetizing and frontloading of future carbon revenues are technically proven in terms of their ability to enhance the bankability of CDM projects, the experience to date highlights the difficulty in operationalizing them due to:

    - the complex (CDM) asset creation process, reducing its value for financiers and investors,

[23] http://newclimateeconomy.report/finance/

[24] http://treasury.worldbank.org/cmd/htm/CO2LBond.html, http://treasury.worldbank.org/cmd/htm/CO2LBond2nd.html. The World Bank's first Certified Emission Reduction (CER) "Carbon Emission-Linked Notes" issued in June 2008 was awarded as one of the "Top Ten Landmark Deals of 2008" by mtn-i and Environmental Finance Awards recognized it as runner up for the Carbon Finance transaction of 2008.

[25] Scale-up can be achieved by expanding the demand side of "a future" market through ambitious and stringent emission reduction targets under a global climate architecture that considers the eligibility of international credits in existing and emerging (compliance) carbon pricing initiatives and their full fungibility across different initiatives to enable a robust and liquid market. In addition, demand can be boosted by stimulating other non-compliance-lead sources of demand (i.e., results-based-finance, social-responsibility actions from private sector entities and voluntary cancellation). On the other hand, to support a scenario of increased demand, it will be necessary to continue building a credible supply at scale by continuing efforts to reform CDM, and adopting a programmatic approach by moving toward large-scale sectoral and implementing policy-based crediting mechanisms.

- the relatively low financial impact of carbon finance in many technologies, and
- the consequent high residual investment risk perceived by financiers in investing in CDM projects.

Even for projects that are able to blend carbon finance into project finance, the transaction costs involved in designing and implementing the tailored-financial structures, and establishing a suitable security package to protect all parties involved dramatically reduce the viability of those structures, as well as the overall interest in replicating them.

- Financial products 4 – Layering / Syndication, 5 – Options and Derivatives, and 7 – Issuance of bonds: financial structures and products such as syndications, bonds and derivatives are technical solutions aiming to address unbearable risks and attract new investors and increase existing financiers' appetite to invest in riskier projects. However, not all parties have access to these products or they are not sufficiently sophisticated to use them. In addition, they can increase overall transaction costs, and therefore in order to maximize investment contribution, they need to be combined with – already complex and costly – monetization and frontloading (see above). As a result these products have been mainly used by secondary market players seeking trade-related hedging strategies and profit opportunities, or by capital market investors.

- Financial product 6 – Insurance / guarantee: these products have the potential to increase the bankability of CDM projects by enabling some investors and financiers to tap into several new countries and sectors deemed too risky otherwise. Although more suitable for project finance of small-scale investments than products 5 and 7 indicated above, and as well detailed in section 1.1, not all project developers have access to insurances and/or guarantees, and depending on the countries and sectors to be covered, these products can become quite expensive, potentially becoming inviable.

Based on the strengths and weaknesses indicated above, there is an opportunity for the Ci-Dev participants to explore options for blending some of these existing financial products to catalyze new investments that will ultimately maximize the transformational impact supported by the Ci-Dev. The main objective is to find an equilibrium between acceptable investment risks and guarantee to maximize results, while limiting exposure. The blending would require Ci Dev participants to:

1. Agree to advance up to 25% of the nominal Ci-Dev ERPA value at no discount and without requesting guarantees. That would aim at supporting the project's investment needs. Disbursement would follow stringent milestones to be defined by the Ci-Dev team in direct consultation with participants. Once projects are implemented and operating, initial CERs can be used to recover the advance payments.

2. Bear the first losses in the investment expenses of Ci-Dev projects seeking underlying finance. That would play the role of an insurance product, but with zero cost to both project developers and other financiers. This would serve the purpose of attracting additional investments to CI Dev projects. In a best case scenario, competition among new investors can potentially bring down overall investment expenses, enhancing Ci-Dev project's financials, and ultimately maximizing the CER delivery. First losses could be initially tested up to the lesser between (an additional) 25% of the Ci-Dev ERPA value, or 15% of the financial gap sought from additional investors. These percentages can be tested and if needed, adjusted on a case-by-case basis and subject to the specific approval from Ci-Dev

participants. Since the first loss has an intrinsic market value, to the extent possible CER prices to be paid by Ci-Dev participants in those ERPAs should be reduced.

Overall, Ci-Dev participants would agree to bear investment risks up to 50% of the ERPA value. A rigorous verification and monitoring process will be defined to measure the potential impact of these investments for further evaluation. A dissemination plan will include a final report for public circulation.