

## Carbon finance as a key financial tool for project development: examples from the World Bank Carbon Finance Business

Alexandre Kossoy

### Background

The World Bank has pioneered the market for greenhouse gas emission reductions through its Carbon finance Business (CFB). The CFB leverages public and private investment into projects that generate emission reductions. Through the carbon finance business the World Bank is working to ensure that developing and transition economies get a sizable share of the growing carbon market under the Kyoto Protocol's<sup>7</sup> Clean Development Mechanism (CDM) and Joint Implementation (JI), with client countries providing high-quality carbon emission reductions in exchange for development dollars, technological know-how, and clean technologies for sustainable development.

### Introduction

Project sponsors face many uncertainties before deciding to invest their time and resources in new projects. Assessing these factors becomes even more acute when considering investments in developing countries, where the impact of external factors may threaten the continuity of the business and influence the viability/success of the project.

Uncertainties such as government taxation, sales quotas, limited access to new technologies, political and economic instability, subsidies from developed countries to their local industries, and local currency fluctuation are among the many variables that need to be assessed. This text briefly talks to those external factors and how they may result in a broad range of risks, much beyond the commonly recognized ones.

The text also provides examples of how carbon finance, through case studies from the World Bank Carbon Finance Business has effectively dealt with important project constraints.

*The World Bank's Carbon Finance Business is part of a larger global effort to combat climate change. The CFB has more than US\$410 million under management in six funds (either approved or under operation), which include: The Prototype Carbon Fund (PCF), a public-private partnership of 17 companies and 6 government entities, which are pioneering the market for greenhouse gas emission reductions; The Community Development Carbon Fund (CDCF) which extends carbon finance to least developed countries and to poorer areas of all developing countries; The BioCarbon Fund which applies carbon finance to agro-forestry and land-use projects; OECD country funds (Netherlands CDM and JI funds, Italy), which expand carbon market development to the private sector.*

### Project finance in a macro economic context

The evolution of the Brazilian economy in recent years illustrates how local interest rates sharply increased and/or local currency depreciated dramatically during each and every successive international crisis over the past eight years: the Asian crisis in 1997, the Russian crisis of 1998, the crisis following the September 11<sup>th</sup>, events in the US, and the Argentinean crisis in 2001. Figure 1 illustrates the local currency and base interest rate fluctuations over that time.

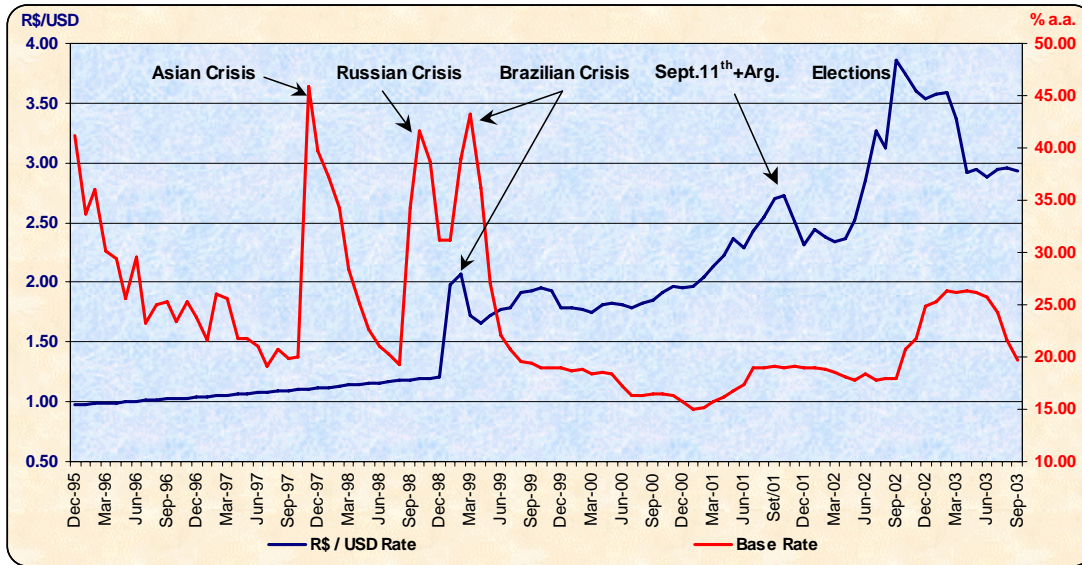
During economic crises, governments may increase local interest rates as a defensive response to an increase in the international risk perception associated with all developing country markets, since international investors and financial institutions will demand higher remuneration for their involvement in those "risky markets" or they will switch their cash investments to places with more favourable "profit over risk ratio". In other words, to avoid a cash outflow from the Country, and to maintain their attractiveness for new foreign savings and investments, local governments are forced to push their internal interest rates upwards, even to the point of negatively impacting their domestic debts.

The other natural consequence of economic turbulence is a sudden increase in demand for hard currency by Country citizens and companies, including the local subsidiaries of multinational corporations. The local government, as a natural provider of hard currency in the market, and as the responsible party for the maintenance of National reserves, starts to curtail the amount of hard currency made available in the market. The unbalanced hard currency supply and demand results in the local currency devaluation, as in 1999, and punctual overshoots as in 2001, and in 2002.

---

<sup>1</sup> The 1997 agreement by industrialized countries to limit climate altering greenhouse gas emissions.

Figure 1 Variation in Brazilian currency exchange and base interest, 1996-2003



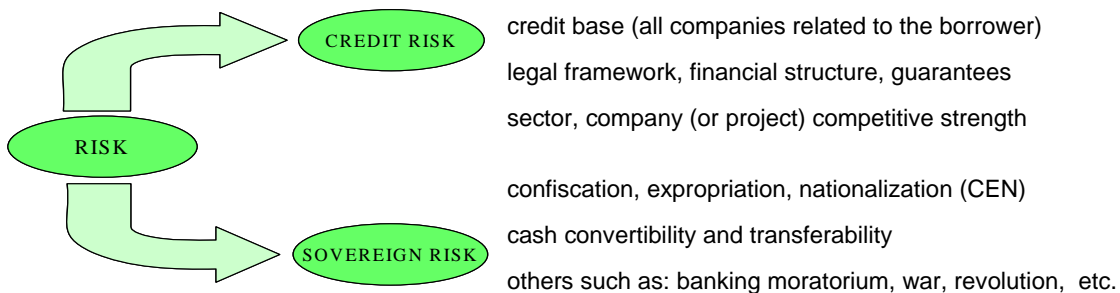
Source: Brazilian Central Bank  
 Note: Currency exchange: Real (R\$) / (Dollar) US\$

Companies located in developing countries and operating domestically are particularly vulnerable to those international macroeconomic pressures and domestic government economic policies. Those with ongoing financial liabilities — whether local or foreign-currency-denominated — experienced increased debt-service costs during these periods<sup>2</sup>, in some cases leading to bankruptcy.

**An insight on how financial institutions analyze risks**

In the same context, the company’s lenders also share the risk when such crises occur during the lifetime of a loan. Therefore, the likelihood of those events occurring, as well as any other external factor that might negatively affect the borrower’s capacity to repay its loan is taken into account and “priced” into the total premium charged by the lender. These factors are commonly combined into the so-called Country Risk<sup>3</sup> (also called sovereign and political risk). Figure 2 shows a breakdown of risks, as adopted by financial institutions.

Figure 2 Risks related to project finance in a developing country



Due to the risks involved, financial institutions set up restrictions for loans in countries where those risks are more likely to happen. This limitation is normally defined in terms of a maximum cash amount available for loans and since the risk is directly linked to the duration of the loan, more restrictive

<sup>2</sup> Assumes loans with variable rates

<sup>3</sup> The country risk includes every potential constraint for local currency convertibility to hard currency equivalents, cash transferability, asset expropriation, confiscation or nationalization of goods, governmental caps on exports (i.e. increase in local market supply), and a sudden increase in taxation on trade or cash payments abroad. Those risks are beyond the borrower’s responsibility, but they largely affect his capacity to produce and sell the goods being used to repay loans or they restrict the cash transfer to the lender’s account.

limitations are imposed to longer-term transactions, unless the country risks can be mitigated. It normally applies for medium to long-term loans (i.e. normally beyond two to three years).

The most common way to mitigate Country Risk is the acquisition of insurance<sup>4</sup> from reinsurance companies, development banks or export credit agencies. The insurance premium is directly related to the features of the transaction and the risk perception in that specific country. However, during economic turmoil, the premium of the insurance increases sharply and its availability is drastically reduced, especially for longer-term deals.

Therefore, a bank's internal requirement for country risk coverage can sometimes become a deal-breaker for any of the involved parties; either due to a tenor limitation for the banks (i.e. the availability of long-term funding may disappear) or to the price limitation for the borrowers (the project sponsors) since invariably, the cost for such insurance is always passed on to them, thus increasing the all-in cost of the loan.

### **The Plantar deal**

The Plantar project in Brazil is one of the projects from which the Prototype Carbon Fund is buying greenhouse gas emission reductions. The Plantar project consists of the substitution of coal by charcoal in the pig-iron industry. The project aims to establish Eucalyptus' plantations in degraded pasture areas, which under local conditions require seven years to mature and ready for harvesting. Upon harvesting, the timber is sufficiently carbonized to generate charcoal, which is subsequently mixed with mineral iron in furnaces to produce pig iron. Due to the long lead time necessary for the eucalyptus to mature it may take up to eight years before the project generates any cash-flow income.

The project's eligibility under the Clean Development Mechanism (CDM)<sup>5</sup> of the Kyoto Protocol and the World Bank agreement to pay for the emission reductions (ERs) generated during the trees' growth would result in additional revenues to the project starting from the project's second year.

However, one of the major constraints for the CDM to effectively reach its objectives to promote projects which would not otherwise occur without the carbon credits, is exactly the timing of the payment for the emission reductions. In most projects, there is a natural mismatch between the needs for up-front investments for construction and the annual payments for ERs, which are tied to their delivery, after the project's completion and the annual or periodic verification of the effective greenhouse gas reduction.

In the Plantar project this constraint was relieved with an up-front loan from Rabobank Brazil to the project sponsor<sup>6</sup>, which was structured in a way that the expected payment for the ERs from the purchaser of emission reductions (in this case the Prototype Carbon Fund or PCF) would perfectly match the loan's amortization schedule. Figure 3 illustrates the above mentioned financing structure, where the World Bank (as trustee of the PCF) pays for the ERs directly into the lender's account. This transaction is commonly known in the lending sector as "export pre-payment".

However, the full financial structure was considerably more complex due to national policies, Central Bank rules, and the sponsor's specific restrictions, which is further described below. In the PCF experience, it is best to analyze each case to determine how best to apply carbon finance to resolve country risks and result in considerable changes in the all-in cost of the transaction for the borrower.

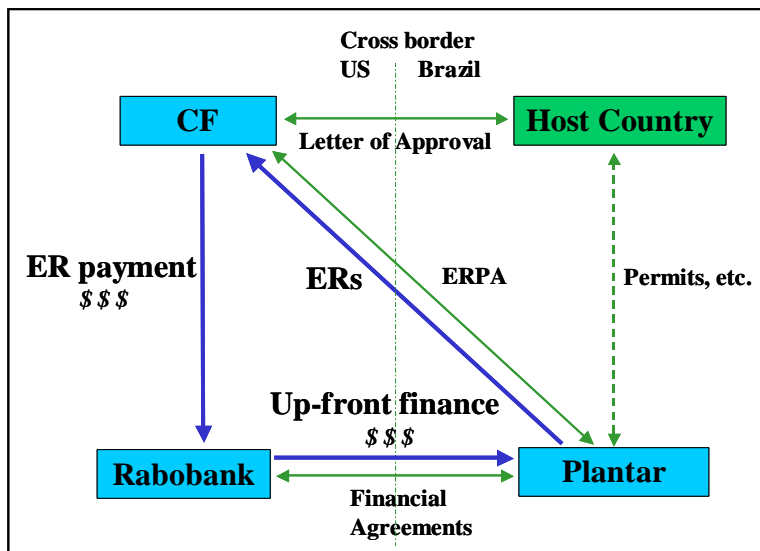
### **Figure 3 The loan structure in the Plantar deal**

---

<sup>4</sup> A Country Risk insurance typically covers: expropriation acts (confiscation, nationalization, requisition and sequestration), restrictions for currency convertibility and transfer, political violence, civil commotion, civil war, rebellion, riot, sabotage, strike, war and terrorism. Even if one or some risks are irrelevant for a specific country they are offered as part of a package, which are typically not customized.

<sup>5</sup> A market mechanism established under the Kyoto Protocol whereby entities in industrialized countries can purchase emission reductions (or carbon credits) in developing countries to meet greenhouse gas mitigation commitments and contribute to sustainable development.

<sup>6</sup> The recipient of the loan is the seller of the emission reductions.



Based on the project finance risk matrix provided in Figure 2, the following lists both general or specific risks identified in this transaction and explains the constraints found in loan approval. They also point out how carbon finance was used to mitigate each of the risks identified, thereby enabling the transaction to be concluded:

➡ **Credit risk (before ERs):** the industrial activity commonly demand for continuous maintenance and it is daily exposed to external factors. In this specific project, the pig iron industry is perceived by the lender as volatile and risky, and the competitive advantage of the project sponsor's activity, when compared to the coal-based pig iron production, was not evident.

☑ **ERs as mitigants:** The payments for ERs were not linked to the industrial activity but rather to the annual sequestration of greenhouse gases during the Eucalyptus' growth. Due to the very cheap and easy maintenance of the plantation after its planting, the repayment of the loan to the lender had almost no delivery risk associated with it. Therefore, the borrower credit risk was mitigated due to the nature of the carbon credit in this deal. We predict that most other agro-forest projects<sup>7</sup> might be perceived by investors and banks as projects with relative low delivery risk after their implementation.

➡ **Credit risk (before ERs):** The sponsor, a local company operating domestically, could become highly exposed to local currency fluctuations, when indebted in hard currency loans. Therefore, the lender did not have a strong incentive to provide the finance.

☑ **ERs as mitigants:** The Emission Reductions Purchase Agreement (ERPA) is denominated in hard currency, working as a natural hedge for foreign exchange risk, reducing the lender's exposure to local currency depreciation. This specific risk mitigation is extremely relevant for all sponsors which operate in domestic markets but want to have access to cheaper international loans. In fact, companies operating in sectors such as renewable energy, energy efficiency, integrated waste management, district heating, and agribusiness activities represent a large portion of CDM sponsors. The ERs, when paid in hard currency should increase the appetite for investors and banks to participate in the project.

➡ **Credit risk (before ERs):** exporters are exposed to the risk of non-payment by their clients in the importing countries, especially when they export their products to importers placed in other developing countries, which are exposed to similar economic risks. In this project, the creditworthiness of the charcoal importers of the client were not clear.

☑ **ERs as mitigants:** The World Bank was perceived by the lender as a risk-less buyer. In fact, all CDM buyers, by definition are based in industrialized countries (i.e. those that have taken on a commitment to reduce greenhouse gas emissions under the Kyoto Protocol or other regional scheme to abate greenhouse gas emissions), which operate with solid currencies ("hard currencies"). These countries effectively have the lowest sovereign risk rates given by the international financial institutions. Additionally, most of the companies interested in the use of ERs to meet their regulatory emission reduction targets are large and structured organizations, with sound credit evaluations. Since the likelihood of ER payment is high, the ERPAs should represent more worthy contracts than some common

<sup>7</sup> These projects are defined in the Kyoto Protocol as "removals by sinks in the agricultural soils and the land-use change and forestry categories", currently defined as Land Use, Land Use Change and Forestry (LULUCF).

off-take agreements and the sellers of CDM emission reductions might offer a high value commodity to be used by lenders as a source of a loan's repayment (or collateral).

➡ **Country risk (before ERPA):** local government's actions that hinder or prevent a loan repayment in hard currency (i.e. local currency convertibility to hard currency and transfer overseas).

☑ **ERPA as mitigant:** Carbon finance payments were structured to be made directly into the lender's account. All exporters have a natural protection against this risk (i.e. buyers are located in Countries with low sovereign risk and agree to pay for the goods directly in the lender's account abroad). As already pointed out, CDM buyers are naturally located in industrialized countries with the lowest sovereign risk. The payment into the lender's account should be provisioned in the ERPA for full mitigation of risk.

➡ **Country risk:** Confiscation and nationalization of goods, and expropriation of assets, which threaten the sponsor's capacity to produce and export their goods.

☑ **CDM as mitigant:** The intangibility of the emission reductions, and the approval of each CDM project by a designated national authority (DNA) in the host country government. Once a letter of approval (LOA) has been issued by such an authority there is minimal chance that the government would subsequently interfere with the generation of ERs and their remission to buyers, almost eliminating those risks.

As mentioned previously in this article, the Plantar project without the Clean Development Mechanism is a pig iron project with an implementation phase of up to eight years before it starts to generate cash<sup>8</sup>. In addition, three years may be required by the project to fully payback the investment. Therefore, a project finance would require the same seven years of grace period, plus three years for amortization in order to match the project's needs.

As already explained earlier, in order to mitigate the above mentioned Country risks the lender would have to buy risk insurance in the market in order to hedge itself and be able to offer a loan for the Plantar project. However, due to the events of the September 11<sup>th</sup>, there was no Country risk insurance available in Brazil for the required duration (ten years) at any price. Therefore, the project was unbankable.

### **The consolidation of the concept in the loan to Plantar**

The emission reductions in the project provided anticipated sources of revenue streams, starting in the second year. The absence of currency convertibility and transferability, and the intangibility of those ERs led the transaction to be rated by the lender as "Country risk free", resulting in the elimination of the obligation to obtain any insurance. Therefore, the project became bankable, and the loan became attractive to the lender. In addition, the credit risk mitigation also resulted in a reduction in the overall risk perception by the lender, which could provide an attractive loan to the company.

### **An alternative approach: the NovaGerar landfill project**

Another PCF project is a good example of how carbon finance can play an instrumental role as a key financing tool. The NovaGerar Landfill Project consists of a sanitary landfill site being developed in southern Brazil, in which the sponsors aim to flare the methane generated on site and to generate electricity from its combustion. However, as in the Plantar case, the project sponsors did not have the up-front capital required to invest in the required equipment.

The project sponsors could have tried to obtain a bank loan using the power purchase agreement (PPA) for the sale of energy to the grid as collateral. However, since the energy sector in Brazil has been facing serious regulatory problems since 2000, energy distributors are highly reluctant to commit themselves through long-term PPAs. Since the project's cash income is very risky, its whole viability was doubtful and the project would probably have struggled to obtain financing for its necessary investment.

However, due to the ERs generated by the project and the World Bank's commitment to acquire all the ERs generated until 2012 (as trustee of the Netherlands Clean Development Mechanism Facility), the sponsor's supplier (i.e. a British producer and operator of flaring and energy systems) agreed to lease their equipment to the sponsor using the ER income as annual payments on the lease.

---

<sup>8</sup> The timing between the planting and the harvesting the trees, producing the charcoal, and finally using the charcoal in the industrial production of pig iron.

In this specific case, due to the high volume of ERs generated by the project, the carbon component not only allows for the full recovery of the supplier's investment in the flaring system, but it can also compensate potential losses in the electricity generation cashflow. The supplier agreed with the project sponsor to be paid through a percentage of the cash income from the ERs. The agreement between the parties has the same period as the Emission Reductions Purchase Agreement and also requires the emission reductions payments to be made directly in the supplier's account in the United Kingdom.

The same sponsor is now being approached and has advanced negotiations with another international bank which may provide working capital resources for this project, using the revenues from the remaining ERs (i.e. the emission reductions not committed for the lease payment) as a loan repayment as in the Plantar deal.

### **Conclusions**

In some projects in the PCF portfolio, the emission reductions are the sole source of reliable income for sponsors. It is therefore essential that lenders understand the value of ERs; this may be the trigger that will secure financing for these projects and make them viable. Special attention should be paid to the ERPA structure. That document may and can significantly mitigate specific risks of the project, materially improving its bankability.

In summary, by maximizing the benefits of the emission reductions and ERPAs, in most CDM projects the qualitative value of the emission reductions, by far, beyond its quantitative value (i.e. its nominal price).