The Role of Carbon Performance Contracting in Climate Change Mitigation

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ABSTRACT

This paper describes the process of applying energy-efficiency performance contracting to the mitigation of global climate change through carbon offset trading mechanisms. Carbon contracting builds on existing experience with energy performance contracting and applies this mechanism to the emerging trade in carbon offsets provided by the Kyoto Protocol to the UN Framework Convention on Climate Change (FCCC).

Energy efficiency technologies, programs and policies provide a large potential for low-cost greenhouse gas (GHG) emission reductions. Investment in these measures can be stimulated through the carbon-trading "flexibility mechanisms" of the Kyoto Protocol, the emerging carbon offset funds, and the process of carbon performance contracting.

Performance contracting via energy service companies (ESCos) appears to be a promising approach to implementing energy efficiency with private finance, especially if it can be complemented by incentives to sell carbon offsets (JI) derived from the energy saved by ESCo projects. Private investment is needed to realize the potential for energy efficiency and emission reductions in developing countries, and it appears that the ESCo model is a viable method for channeling such investment.

An example is given of an energy-efficiency project in Mexico, which is the first application of performance contracting in that country, and the first energy efficiency project to be approved as a JI project in Mexico. This example illustrates the financial and technical mechanisms needed to exploit energy efficiency measures as carbon offset project options.

Background

The UN Framework Convention on Climate Change (FCCC) allows for the joint implementation (JI) of measures to mitigate the emissions of GHGs. The concept of JI refers to the execution of emission reduction measures in one country with partial or full financial and/or technical support from another country, potentially fulfilling some of the supporting country's emission-reduction commitment under the UN FCCC.

In December 1997, the Third Conference of the Parties (COP) to the UN FCCC was held in Kyoto, Japan. The Annex I (industrialized) countries agreed for the first time on emission reduction targets, which vary widely. Also, the concept of joint implementation (JI) was endorsed, and the Kyoto Protocol provides for credit against emission reduction commitments in the time frame of 2008-2012. The Kyoto Protocol provides for three "flexibility mechanisms:" emission allowance trading between Annex I (industrialized) countries, JI carbon offsets within Annex I, and the clean development mechanism (CDM), which involves carbon offsets in developing countries.

Energy efficiency projects offer some of the most attractive opportunities for JI/CDM projects. Because energy efficiency measures are generally close to commercial viability, they offer the prospect of relatively low-cost carbon offsets. The technical efficiency potential in developing countries is large and offers benefits in terms of technology transfer and pollution prevention. Carbon offsets under the CDM regime could become a major source of funding for energy efficiency in developing countries.

Because carbon offsets represent emission *reductions*, they can only be quantified as differences that can only be measured relative to a *baseline*. The definition of the baseline is inherently counter-factual (it will be replaced by the proposed project) and thus somewhat uncertain. Nevertheless, the establishment of the baseline is the key step in determining the extent to which a carbon offset project satisfies the requirement of *additionality* under the JI and CDM trading regimes. The criterion of additionality requires that a carbon offset project represents emission reductions that would not have occurred otherwise.

Meanwhile, performance contracting via energy service companies (ESCos) has become an important option for financing energy-efficiency projects. Performance contracting provides a way for private businesses or public agencies to borrow against future energy savings to finance the purchase of energy-saving equipment, installation, and maintenance services. Fortunately, several of the important aspects of performance contracting, including the financial structure, baseline evaluation, and monitoring and verification needs, are similar to the needs of carbon offset projects. Thus, it appears feasible to use the concepts of performance contracting to design a process to implement energy-efficiency carbon offsets through "carbon contracts."

Structural Components of Different Performance Contracting Models

In essence, performance contracting is a way for private businesses or public agencies to use future energy savings to purchase energy-saving equipment, installation, and maintenance services. Performance contracting uses guaranteed energy savings from installed efficiency measures to pay for the project, enabling a facility to finance an otherwise unaffordable energy-efficiency project (Swisher and Wang 1997).

An ESCo makes the initial investment, which is repaid by retaining a percentage of the energy savings for 5-10 years. The building owner gets the new equipment and a share of the savings during that time, and then keeps the equipment and all future savings thereafter. A key feature of performance contracting is the ESCo guarantees a minimum level of cost savings during the contract term, which is enough to cover the financing costs.

ESCos market the customer, provide the pre-investment funding, design and implement the project, and arrange financing. Most energy-efficiency projects are financed mostly with commercial debt in the form of working capital to the ESCo or credit to the end-user, backed by the reputation of the ESCo and, more importantly, a strong contract with the end-user. Other typical forms of finance are lease programs and vendor finance.

Third-party financing for energy-efficiency projects is highly dependent on sound contracts between the end-user and the ESCo. The principal contract driving the financing is the performance contract. As the name implies, a performance contract does not specify how an energy-efficiency project must be implemented, in terms of measures or technologies, but it does specify the required savings in energy costs per square meter of a facility. Thus, in performance contracting, some part of the contract is based upon the ESCo's performance in delivering verifiable energy savings.

The performance guarantee *shifts some risk away from the end-user*, and provides an incentive to proceed with the project. In addition, the performance contract usually minimizes or eliminates the up-front cash outlay by the end-user. The end-user will have reduced costs through higher efficiency operations, and will pay the energy manager from these savings, retaining some portion for itself until the equipment costs are paid back (shared savings). After the project has been paid for and the contract has expired, the owner retains all of the savings. The energy manager is guaranteeing the performance of the project, and in some cases puts his profit at risk during the life of the contract. The ESCo benefits from the project by receiving fees from the project, and by its return on investment. The revenue from the project will be in the form of savings through reduced fuel bills or reduced electricity consumption.

In a performance contract, an ESCo uses a turnkey approach to project management. Several project stages are combined into a single procurement process, through the performance contract. The ESCo is responsible for feasibility analysis, design, purchasing, installation, operation, monitoring, certain types of maintenance, and necessary training.

The ESCo brings financing of all project costs, and the facility owner does not need to make any initial capital investment. As a result, the facility owner can often enjoy positive cash-flow as soon as the project operation begins. Payments to the ESCo are made after project completion and are contingent on the verified energy savings. Thus, the ESCo, rather than the customer or the investor, bears most of the technical risk of the project.

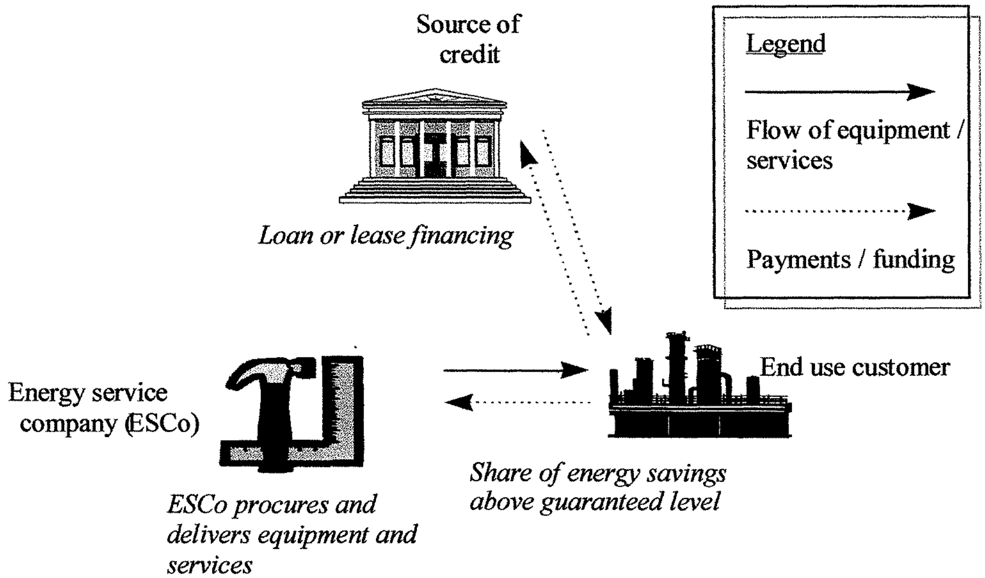
Because ESCos have specialized expertise in the energy-efficiency field, they can select proven, state-of-the-art technologies for efficient lighting, space conditioning, energy system control and motor operation. Although some ESCos have been formed by equipment manufacturers, especially those making building control systems, most successful ESCos are independent of specific manufacturers and product brands. This makes it possible for the ESCo to choose among all available brands and to use competition in the equipment markets to obtain lower prices for ESCo clients. The combination of ESCo financing and collective, competitive procurement can be a strategy to reduce project implementation costs.

The ESCo is paid on the basis of the energy cost savings generated by the project. The ESCo generally guarantees a minimum level of cost savings during the contract term, which is used to cover the financing cost (debt service). Depending on the type of performance contract, the financial risk may be distributed in different ways among the ESCo, the facility owner, and the financial institution.

Energy savings are initially estimated in the feasibility study and later verified through energy monitoring. Because the ESCo has an economic incentive to achieve solid performance, facilities commissioning and monitoring are essential elements of ESCo projects. Once the payments have covered the ESCo's costs and fees, and the contract term has expired, all subsequent savings belong to the facility owner. A typical performance contract has a term of 5-10 years. Ideally, the term should be somewhat more than twice the simple payback time for the energy-efficiency measures.

There are three generic types of performance contracts (see Figures 1 and 2). Each performance contract arrangement carries somewhat different degrees of risk for each party. The three types are guaranteed-savings projects, shared-savings projects, and pay-from-savings projects.

Figure 1. ESCo Financing: Guaranteed-Savings Performance Contracts



Guaranteed-savings contracts are the most common performance contracts. The customer finances the design and installation of the efficiency measures by borrowing funds from a third party (usually a commercial lender) or by leasing the equipment. The customer therefore assumes some risk related to the debt service, but the ESCo guarantees that the energy cost savings will meet or exceed the monthly loan payments. If the minimum savings are not achieved, the ESCo agrees to pay the difference to the customer. Thus the ESCo assumes the performance risk. If the savings exceed the projected minimum, as expected, the customer agrees to pay the ESCo a certain share of the additional savings.

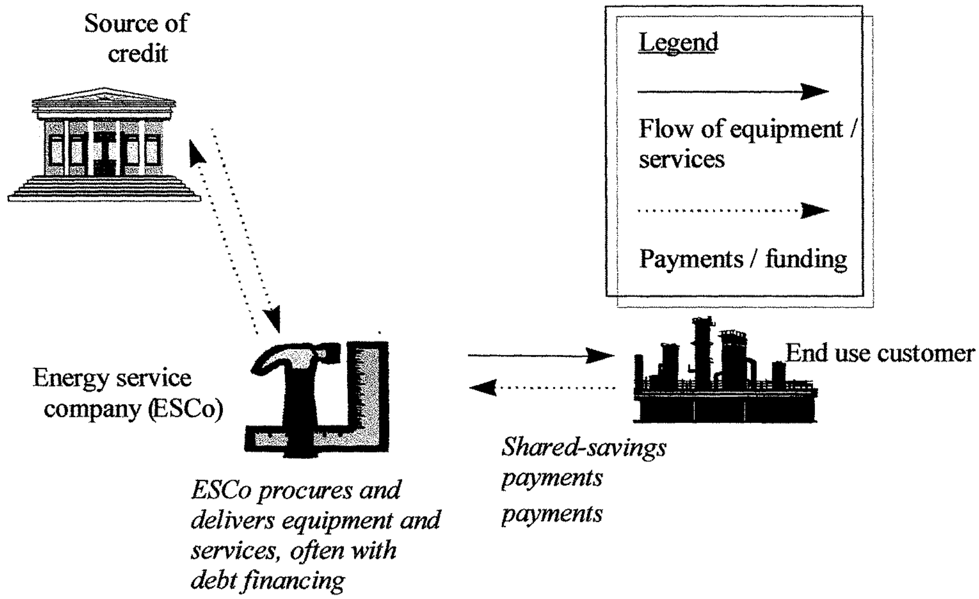
Shared-savings contracts are similar to guaranteed-savings contracts, but the ESCo, rather than the customer, generally borrows the funds from a third-party or finances the project from its own resources (See Figure 2). The customer pays the ESCo a share of the monthly energy cost savings. Because the ESCo is taking all the financial risk as well as the performance risk, the ESCo share of the savings is generally large, as much as 90%.

Shared-savings contracts are attractive to customers that cannot or will not assume new debt commitments, which is often the case with regard to public-sector facilities such as schools and hospitals. Because of their risk exposure, ESCos generally rely on high-reliability, short-payback measures such as energy-efficient lighting retrofits in shared savings contracts. This financing arrangement can also be contracted under a guaranteed- savings contract, but the savings guarantee would be relatively modest. In such a case, the financial structure is similar to a leasing arrangement.

In *pay-from-savings contracts*, as in guaranteed-savings contracts, the customer borrows funds from a third party (usually a commercial lender) and repays the loan according to a certain share of the monthly savings, which can vary with weather, occupancy and energy prices. Pay-from-savings contracts are therefore risk-free for the customer, and the ESCo avoids the financial risk. Although the ESCo does not guarantee a certain level of energy cost savings, it does guarantee that the installed equipment performs according to the design.

Thus, the lender assumes some financial and performance risk. This increases the cost of debt financing, making this type of performance contracts less popular.

Figure 2. ESCo Financing: Shared-Savings Performance Contracts



Baselines for energy-efficiency projects

The principal performance parameter in ESCo projects involving energy-efficiency measures (EEMs) is the net energy savings. The approach to determining net energy savings involves comparing energy use within a facility, or certain systems in a facility, both with and without the installation of the EEM. Thus, ESCos must address the same type of baseline issue with regard to energy savings that developers of carbon offset projects face with regard to emission reductions. The methods that have been developed to determine ESCo project baselines should be applicable to baselines for crediting carbon offsets.

For projects in existing buildings or facilities, the "before" case is the baseline. The project case is the "after," or post-installation case. In new construction projects, the baseline case is counter-factual, in that it cannot be directly observed before installation of the EEM. New construction by definition will not have pre-retrofit information for use in calculating energy savings. Thus, baseline energy use has to be determined by methods other than direct pre-installation inspections or measurements. Where Minimum Energy Performance Standards (MEPS) are in effect, energy savings can be calculated as the difference between the MEPS energy performance level and the actual performance.

In other cases, however, comparable performance levels must be determined for the individual end-use that is being assessed. Such standards should be: 1) consistent with sufficiently "good practice" under the status quo that they avoid rewarding performance that would be achieved regardless, and 2) sufficiently less than the state-of-the-art to leave opportunities for investments that move the energy system in the direction of sustainable development. The technical analysis needed to select the proper level for this type of standard could build on existing work and should not involve prohibitive costs. Supporting such analysis and facilitating international agreement on standards should be a high-priority policy measure related to JI and CDM (Swisher 1999).

Difficulties with the ESCo Model for Energy-Efficiency Implementation

The ESCo model appears to have a promising role in the implementation of energy efficiency projects and carbon offsets. The application of performance contracting to carbon offsets is discussed in the next subsection. Note, however, the following difficulties and limitations regarding the application of the ESCo model in developing countries:

- Complexity of contracting, monitoring and verification: the process of initiating performance contracts between three or more parties, and then monitoring and verifying the actual project operation and performance involves a complex and potentially expensive effort. These costs can be reduced through experience and standardization, but to some extent they are inherent in the process. Note, however, that baselining, monitoring and verification are inherent requirements in the development of carbon offsets, and as such these requirements do not add to the transaction costs of using ESCos to develop offset projects.
- High development and transaction costs: One problem that is common in the ESCo business is the cost of identifying and developing new projects, including the costs of pursuing potential projects that are not realized. These transaction costs raise the required return on ESCo projects that are realized, making it harder for projects to qualify. Although these costs are to some extent inevitable, they can be reduced via technical assistance with project identification and pre-qualification, for example, based on financial data from the records of partner financial institutions in the local market.
- Bias of equipment vendors as ESCos: Some ESCos have been started by manufacturers of equipment such as building controls. While this arrangement brings relevant expertise and the resources to help finance projects, it tends to narrow the scope of technology applications and remove the potential for using competitive procurement to reduce costs.
- Dependence on utility programs or fiscal incentives: ESCos are popular in multilateral financial institutions as a private-sector alternative to policy-driven programs such as utility demand-side management (DSM) programs, which have fallen from favor in recent years. This view is somewhat naïve, however, as many of the large ESCo projects that have been implemented to date, particularly in North America, were actually supported by DSM programs. The distinction between ESCos and DSM projects is arbitrary in any case. However, it is important to note that the economics of ESCos are challenging (due to the costs noted above), and support from DSM programs or other fiscal incentives, as well as carbon offset sales, can significantly increase the range of projects that are viable.
- Difficulty in supplying new facilities rather than retrofits: The typical ESCo project is in an existing facility, where old inefficient equipment and processes are replaced, and savings are measured based on the improvement from the existing systems' performance. There are, of course, large additional efficiency gains (and co-generation potential) in new and renovated facilities. Because the baseline for new facilities is more efficient, it may be expensive for ESCos to improve performance or, more likely, it may be difficult to

measure savings with confidence against a counter-factual baseline. However, in a new facility the ESCo has the additional potential to use equipment efficiency to downsize, e.g. HVAC systems, saving capital costs and providing part of the guaranteed performance and financial returns.

- Cream-skimming: ESCos must earn a commercial rate of return on the energy savings that result from their investments. This pushes their marginal payback threshold down to, at most, about three years. As a result, technically feasible measures are excluded even thought they would be viable based on less stringent financial criteria, such as a utility's rate of return. This "cream-skimming" of only the most profitable measures can be seen as a reduction in the total energy-efficiency potential. This is inevitable unless incentives such as DSM programs or high carbon offset prices are available.
- Vulnerability to energy price changes: The deregulation of energy supply systems is leading to significant changes in prices, which affect the financial performance of energy-efficiency measures. In some countries prices are falling, while in others prices are rising toward international levels. Such changes can create risks for all parties in an ESCo transaction. One way that ESCos are managing this risk is to form "super-ESCos," which combine energy services contracting with energy commodity purchasing. In this case, the values of the two products move in opposite directions due to price changes, reducing the net variation. Another strategy of the super-ESCo is to offer development of on-site generation to complement the end-use energy services and purchases.

Potential Role of Performance Contracting Applied to Carbon Contracts

Because energy-efficiency measures are generally close to commercial viability, they offer the prospect of relatively low-cost carbon offsets under the JI and CDM provisions of the UN FCCC. The technical efficiency potential in developing countries is especially large and offers benefits in terms of technology transfer and local pollution prevention. To capture this potential, new and innovative mechanism for financing energy-efficiency projects need to be applied in this region. Traditional project finance is appropriate, but the small size of energy-efficiency projects limits the potential due to high transaction costs and the risk perceptions of traditional financing sources.

Performance contracting via ESCos appears to be a promising option, if this process can be successfully adapted to the local conditions. Fortunately, several of the important aspects of performance contracting, including the financial structure, baseline evaluation, monitoring and verification needs, are similar to the needs of carbon offset projects. Thus, it appears feasible to use many of the concepts of performance contracting to design a process to implement energy-efficiency carbon offsets through *carbon contracts*.

Under a carbon contract, whether a performance contract or other type, a project sponsor enters into a long-term carbon offset delivery obligation with a buyer. Once the contract is in place, the investors would be able to treat the carbon revenues as they would any other revenue stream. Ultimately, the impact of additional revenue from carbon offset sales on project financing could help clean energy projects achieve commercial viability, as an alternative to subsidies, special tariffs, grants, or other non-commercial mechanisms. From the perspective of investors, the additional revenue would provide more secure cash flow to cover debt servicing and/or justify improved credit terms (i.e. longer maturities, lower interest rates, etc.) with lenders.

On a more conventional project finance basis, a commercial bank may in the future be able to lend to a project directly on the basis of the anticipated cash flows from the carbon offset sales. These cash flows need not represent all of the debt required for the project, but rather a portion of the debt that nevertheless helps make the overall project commercially viable. Lenders traditionally seek high ratios of debt service coverage for small energy projects that are perceived to be high-risk investments, so any cash flow that makes repayment more secure is helpful.

The Carbon Revenue Stream and Additionality

Energy-efficiency projects can generate an additional revenue stream (beyond energy savings) from the potential sale of carbon offset credits. Today, this "carbon revenue stream" is extremely uncertain due to the lack of a formal, international market for carbon credits. However, there have been a number of international carbon trades that constitute the beginnings of an offset market (Swisher, Renner and Shepard 1999).

The carbon revenue stream also plays a potentially important role in a broader debate about the "additionality" of commercial activity that leads to reductions in GHG emissions. As mentioned earlier, the criterion of additionality requires that a carbon offset project represents reductions that would not have occurred otherwise. This is the "but for" criterion: total GHG emissions would be higher, *but for the effect of the carbon offset project.*

This issue affects projects that are commercially viable, i.e. profitable, for the investors. Some analysts argue that if a project is profitable, sponsors could be expected to implement the project regardless of the carbon offset benefits, and that the reductions therefore would not be additional to what would have occurred in the absence of the project. In such a case, the project would fail the "but for" condition for additionality. This criterion of financial additionality has been applied to JI project proposals by some government review bodies, despite the fact that *the Kyoto Protocol does not address the financing of JI projects, the source of such finance, or the intentions and alternatives to such finance*.

The condition of financial additionality requires examination of the economics of project finance. For example, an offset project with a modest cost per ton of emission reduction, on a net-present-value basis, would generally produce revenues that, over the life of the project, could exceed the corresponding investment (i.e., profit), on an *un-discounted* basis. However, a project that earns a very low rate of return would not be considered economic on a project finance basis under any normal conditions, and thus additional funding would be needed to make it viable.

The analysis becomes more difficult, however, when a project's rate of return is high enough that it might be secure financing *under certain conditions*. Such conditions generally involve relatively low risks, which could make a project attractive to investors at relatively modest rates of return. A conventional fossil fuel project, for example, might receive financing because it is considered a relatively low risk and therefore does not require a corresponding high rate of return to secure investors' funds.

There are, however, many sources of risk for the types of projects, technologies and locations likely to be involved in carbon offset investments. In particular, small energy efficiency, co-generation and renewable energy projects in developing countries face risks of size, location, technology, dispersed customer bases, lack of credit-worthy customers, etc. ~~In~~ a commercial environment, these risks drive the required rates of return for commercial finance higher than those required for conventional energy project investments (EIC 1997).

Additional funding may be necessary to raise a risky (in conventional financial terms) offset project to a high enough rate of return to make it viable, while other more familiar (and safer) projects may be viable at lower rates of return (see Table 1). This relationship is implicit to the perspective of risk-return analysis that determines most commercial financing decisions. To those unfamiliar with such analysis, however, it may appear that projects that are "already profitable" are demanding both incremental financing and offset credit.

Table 1. The Hierarchy of the Economic Viability of Carbon Offsets Projects.

• Projects with negative rates of return	⇒ Clearly not viable without concessional financing resources or carbon offsets available ⇒ Offset cost per mtC would be expensive
• Projects with rates of return below normal market threshold	⇒ Probably not viable without concessional financing resources or carbon offsets available ⇒ Offset cost per mtC would be moderate
• Projects with rates of return above normal market threshold, but below risk premium for project type, technology, country	⇒ Marginal with private finance only; viable with concessional finance or carbon offsets available ⇒ Offset cost per mtC would be inexpensive
• Projects with rates of return above normal market threshold, including applicable risk premium	⇒ Viable with private finance only; concessional finance unnecessary ⇒ Carbon offsets precluded by lack of additionality

Such projects show positive rates of return yet are still unable to secure project financing. They are profitable but can only be financed if the revenues from carbon sales make them commercially viable. The potential benefit of revenues from carbon sales is greatest in this gray area of risk assessment and financial decision-making. The project finance model is also an ideal tool for determining if a project is viable but lacking marginal "additional" funding, or simply not viable. In any case, a large amount of project-level reductions – at low cost and on a sustainable basis – can be achieved through project finance that captures the potential revenue of carbon offset sales.

Example of a Carbon Performance Contract

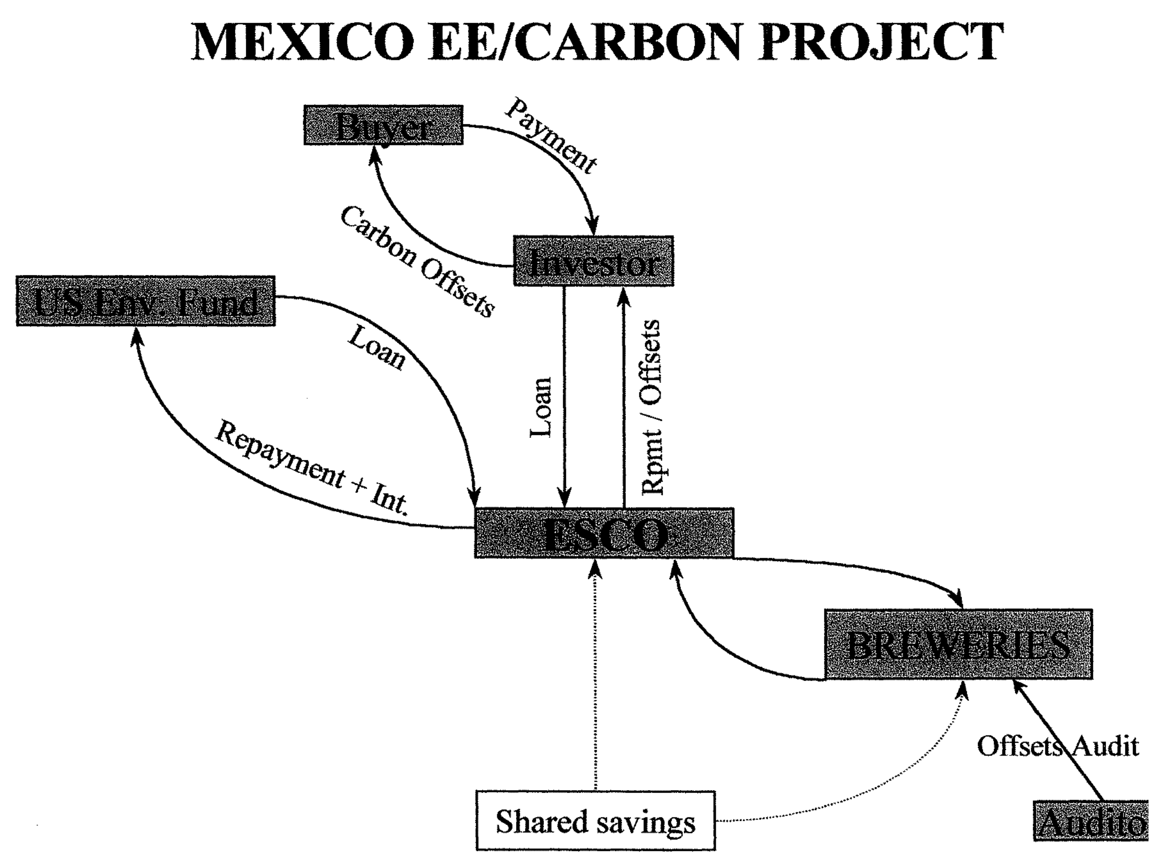
An example of applying the potential value of carbon offsets to improving the economics of a standard energy-efficiency project was implemented at two breweries in Mexico. The project, which is the first energy-efficiency performance contracts to be executed in Mexico, involves the Navajoa and Tecate breweries owned by Cervecerías Cuauhtémoc Moctezuma in the state of Sonora.

Financing for the project is from the Environmental Enterprise Assistance Fund (EEAF), a U.S.-based environmental fund, and Fideicomiso para el Ahorro de Energía Eléctrica (FIDE), a Mexican trust fund for energy conservation, which provided Mexican peso financing. The financing was directed to a Mexican ESCo that performed the engineering analysis and design of the efficiency measures at the breweries. Under a five-year, shared savings, performance-based contract, the brewery makes quarterly payments to the ESCo based on actual savings measured by the brewery. The ESCo, in turn, repays the U.S. and Mexican investors (see Figure 3).

The installed efficiency measures include control up-grades on about 80 motors that run fans, pumps and other electric devices. The reduced energy consumption resulting from the installed efficiency measures will lead to expected carbon offsets of more than 1,000 metric tons of carbon-equivalent (mtC) per year over the five year term of the contract. The offsets are available for sale or trade in anticipation of a formal trading market in the future.

Under the terms of the contract, the U.S. developer Econergy International Corp. will receive the carbon offset credits. This transaction also will be executed under a performance-based contract, which will help minimise the risks that the offsets are not delivered on time or in the agreed amounts. The economics of the project are such that carbon sales provide needed revenue for the project. Because the project is executed under a performance-based contract, the risks that the offsets will not be delivered as agreed are reduced.

Figure 3. Financial Structure of a Performance-Based Carbon Contract



This project is expected to become the first energy-efficiency project to be approved as a JI project by the Mexican government. Because the project is being implemented in a non-Annex I country, it may be eligible to receive carbon offset credit under the CDM. However, the same project structure and financing mechanisms could be used for JI projects within Annex-I countries.

The financial structure of this project is shown in Figure 3. In this model, the carbon offset buyer provides the investor with some of the capital to participate in the ESCo project. The buyer may directly invest in the project, but it is possible that intermediaries will bundle carbon purchase funds and secure deliveries through carbon contracts on behalf of buyers. For example, an intermediary may lend to a project at commercial rates that are below its internal cost of capital, intending to make up the difference plus a profit through the sale of carbon offsets from the project in addition to repayment of the loan.

As with other components of the project's performance, it is typical for the carbon buyer to expect that the project sponsor share the risk of non-delivery of the carbon offsets. This can be achieved by executing a contract that includes an initial payment for the buyer to secure rights to the project's carbon offset credits and pay for these over time and on delivery.

The key elements of a carbon contract can be illustrated based on specific details of the Mexico energy-efficiency project described above. These elements are discussed below (Ashford, Moscarella and Swisher 1998).

Project Description: Installation of controls on electricity-consuming equipment at a brewery in Mexico. Demand and energy savings shared by the brewery and the ESCo through quarterly payments from the brewery to the ESCo.

Buyer: The buyer contracts to purchase emissions reductions units of carbon (hereafter "carbon"), generated by an energy efficiency project (hereafter, "the project") implemented by the ESCo on the premises of two brewery facilities in Mexico.

Seller: The investor (i.e. seller) contracts with the buyer to sell units of carbon to which it has title through agreement with the brewery (the agreement between the ESCo and the breweries is necessary for this agreement).

Contractual Arrangements: The ESCO contracts to provide the investor with carbon from the project under the following terms and conditions:

- Volume of carbon: The ESCo will provide investor with emissions reductions totaling 5,100 mtC over five years, with deliveries on an annual basis during the period beginning January 1, 2000, and concluding December 31, 2004. The annual carbon deliveries will be no less than 1024.8 mtC. In the event that deliveries exceed 1024.8 mtC in any given year, the mechanisms governing payments in consideration of excess carbon deliveries will apply. In the event that deliveries fall short of 1024.8 mtC, the mechanisms governing failure to deliver the minimum volume of carbon will apply.
- Pricing: Buyer will pay the seller US$10.00/mtC delivered by the ESCo when carbon deliveries are greater than or equal to 512.4 mtC (50 percent of the minimum volume), up to the minimum volume specified.
- Penalty for Failure to Delivery the Minimum Volume of Carbon: Buyer will withhold payment for carbon deliveries in the event that an annual delivery is less than 512.4 mtC.

- Premium for Delivery of Carbon Offsets in Excess of Minimum Volume: In the event that the ESCo should deliver more than the specified minimum volume in any given year, the buyer will have the option to buy the excess offsets at a price of US$9.00/mtC.

This example provides only the basic elements of what is necessary to execute a carbon performance contract. Additional clauses in this kind of a contract may entail purchase rights or options that protect the buyer from shifts in market prices (i.e. if the price falls, the buyer is not obligated to hold at that price). The fundamental goal of the contract is to encourage and reward performance that meets or exceeds contractual obligations, leading to greater overall confidence in the revenue stream necessary for project finance.

Conclusion

Performance contracting via ESCos is a promising option for financing energy-efficiency projects, assuming this process can be adapted to new market conditions. Several aspects of performance contracting, including the financial structure, baseline evaluation, and monitoring and verification needs, are similar to carbon offset projects. Thus, it appears feasible to use the concepts of performance contracting to design a process to implement energy-efficiency carbon offsets through "carbon contracts." The nascent international carbon market includes several funds, clearinghouses or buyers' consortia that might become important players in the future. Today, the demand from these funds for carbon offsets should be viewed as one potential revenue source in a project-finance package. This revenue is yet not by itself sufficient to justify energy-efficiency investments, but it can be part of a structured financial package to support efficiency projects.

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