

NEW FINANCIAL INTERMEDIATION MECHANISMS FOR ENERGY EFFICIENCY PROJECTS IN BRAZIL, CHINA AND INDIA

Analysis of the Viability and Design of a Guarantee Facility for Energy Efficiency Projects

August, 2005

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PREFACE

This report was prepared as part of the project *Developing Financial Intermediation Mechanisms for Energy Efficiency Projects in Brazil, China and India*. The project is supported by resources from the United Nations Foundation and the ESMAP Fund administered by the World Bank.

The project is coordinated internationally by the World Bank and the United Nations Environment Program (UNEP), in partnership with entities in each country. In Brazil, the project is coordinated jointly with the Brazilian Association of Energy Efficiency Service Companies (ABESCO - Associação Brasileira de Empresas de Conservação de Energia).

The project supports activities in each country which seek to increase commercial third-party financing of energy efficiency projects, be it through debt or equity. Increased access to such financing is viewed as essential for the expansion of the energy efficiency services market in all three countries.

The project also supports exchanges between the three countries regarding their experiences. There have been several such exchanges since the beginning of the project in 2002: in Goa (India) in 2002; in Beijing in 2003; in Angra dos Reis in 2004 and in Beijing in April of 2005. Others will occur.

As a follow-up to the meeting held in Angra dos Reis in May, 2004, several activities were planned in Brazil ranging from training to the preparation of reports on key aspects of financing energy efficiency projects. This is one of three reports so far published on the financing of energy efficiency projects. Downloads of this and other reports can be made at: www.abesco.com.br and http://3countryee.org.

EXECUTIVE SUMMARY

Although there is a large potential for economically viable energy efficiency projects in Brazil, the market is still very small. One of the main reasons for this inconsistency is the near total lack of access of ESCOs (Energy Service Companies) to loan financing for energy efficiency projects.

Commercial banks are willing to provide loans only to companies which have a strong financial structure. In addition, banks are unfamiliar with energy efficiency projects and are therefore reluctant to provide loans for this type of operation. Since the ESCOs generally have a very weak financial structure and very limited capability to provide real guarantees a Guarantee Facility is a key mechanism to overcome this hurdle.

This report addresses the design and feasibility of a Guarantee Facility for bank credit for energy efficiency (EE) projects. It begins by reviewing the commercial bank and ESCO sectors in Brazil and considers diverse international experiences. It then directly addresses specific issues in the design of a Facility for energy efficiency projects and proposes a basic model adapted to the conditions in Brazil. Simulations are then performed to test the financial equilibrium and cost of the guarantee and their sensitivity to changes in some key parameters.

A draft of the report was reviewed and key issues discussed in several meetings involving stakeholders in the financial and ESCO sectors. This review has clarified some points and led to some refinements, but there was broad acceptance of the basic model proposed.

The primary objective of the Guarantee Facility is to stimulate the energy efficiency industry, giving ESCOs and their clients the opportunity to obtain the necessary debt to finance the energy efficiency investments. At the same time, in order to reinforce the credibility of the guarantee, we have assumed that the capital of the investors in the fund should not be considered as grant money, but preserved and indeed aim to meet a benchmark return. However, the benchmark return used in the simulations of the Guarantee Facility described below is less than private markets would accept, considering the uncertainties and risks involved. There is a compromise between "credibility" and development objective of fomenting activities that generate public benefits in addition to private ones. Therefore, public funding of the guarantee capital should initially be considered.

For the purposes of the financial simulations of the Guarantee Facility we estimated that a capital of R$6.5 million would be needed to initiate the operation of the Facility. This value was based on an estimated current market of about R$80 million per year of energy efficiency projects and assumes that 80% of the investment would be debt. We also assumed a maximum leverage of 10x the capital for the total value of the guarantees given.

This estimate of the initial capital is only provisional, but it serves to illustrate a key point: even a small outlay of capital could have a large effect on the volume of projects. In the Baseline Case of the simulations, projects worth approximately R$780 million would have received guarantees within eight years. There are very few, if any, public investments in energy efficiency which could so dramatically catalyze effective results.

The Structure and Procedures of the Guarantee Facility

The key stakeholders in the Guarantee Facility are: the investors in its capital, the Facility manager, commercial banks, the ESCOs and energy consumers making EE investments.

Given the uncertainties involved and the returns assumed, it is almost certain that the investors will not come from the private sector; they will be from the public sector. Examples would be the BNDES, FINEP, SEBRAE or regional development banks.

The emphasis should be on obtaining the initial capital from domestic investors. The volume of capital required is quite small to justify the complexity of an international negotiation – which would also add substantial delays. Considering the resources currently spent on energy efficiency in Brazil, lack of domestic resources can hardly be a key restriction, if a Guarantee Facility is really considered a priority for energy efficiency. ABESCO (the Brazilian Association of Energy Services Companies) and some business federations will have an important role in communicating this priority to government policy makers.

Brazilian legislation allows a Guarantee Facility to be legally constituted and there are several guarantee funds in operation in the country with public sector capital (as well as some private sector arrangements). The manager of the Guarantee Facility should be a company with experience in the energy efficiency market and also able to evaluate credit. The investors will be responsible for choosing the manager. The management entity should be composed of: 1 director, 2 executives (1 for evaluating the credit and 1 for administrative activities) and 2 assistants. The other activities, such as accounting, fiscal, legal, treasury and so forth which are not the core business of the Facility, would be outsourced.

A committee composed by the investors and by the director will approve all the guarantees to be issued by the Facility. Before submitting a proposal to the committee, the operation must have been analyzed and approved by the credit department and by a technical expert. In principle, any kind of project with a threshold % of EE investments (fuel or electricity) would be a candidate. The loan can be to either the ESCO or the energy consumer contracting efficiency services. (To simplify discussion here, we describe most transactions as going through the ESCO - which is likely to be the case, at least initially)

The credit analysis will be conducted internally, by the Guarantee Facility staff. The technical analysis is a more complex issue, due to the many types of energy efficiency projects. In order to maintain the Guarantee Facility with a slim and adaptable structure, the technical analysis will be conducted externally by companies or other entities which have the capability to evaluate the diverse kinds of EE projects. The Guarantee Facility will accredit the companies which conduct the technical analysis.

The technical reviewer will issue a document approving the feasibility of the project and also its economic soundness. The technical reviewer will be contracted directly by the ESCO, who will be responsible for the payment. The loan to be provided by the bank will incorporate the fee for the technical review, so the ESCO need not disburse money.

The credit analysis, to be conducted by the Guarantee Facility, will be of no charge (or rather this item will be built into the cost of the facility and covered by the guarantee fee). It should be made prior to the technical analysis in order to reduce the risk of the ESCO investing in the technical review of a project which is not viable due to credit problems.

The Guarantee to be issued by the Facility should be up to 100% of the loan, leaving the commercial banks almost free of the credit risk. The only residual risk will be on the interest of the operation. This is a key factor for the success of the Facility. The banks should perceive the credit risk of the operation as being that of the Guarantee Facility and so long as it is comfortable with that risk, they should provide the loan to the ESCO or the ESCO's client. The banks have to view the guarantee provided by the Facility as primary and sufficient to make the loan.

If the banks treat the guarantee as secondary, the Guarantee Facility will not be feasible. The bank will already have asked for all the guarantees the ESCO would be able to give, leaving nothing that the ESCO could give to the Guarantee Fund.

The Investor, the Facility Manager and ABESCO will have to play an important role in describing how the guarantee will operate and the risks involved to the commercial banks. The commercial banks must have confidence in the guarantee provided by the Facility.

In the case of default by the borrower (the ESCO or the ESCO's client) on the loan given, the Guarantee Facility will immediately pay the bank and will start to execute the guarantees against the ESCO. The Guarantee Facility's response in the case of default will be critical to its credibility.

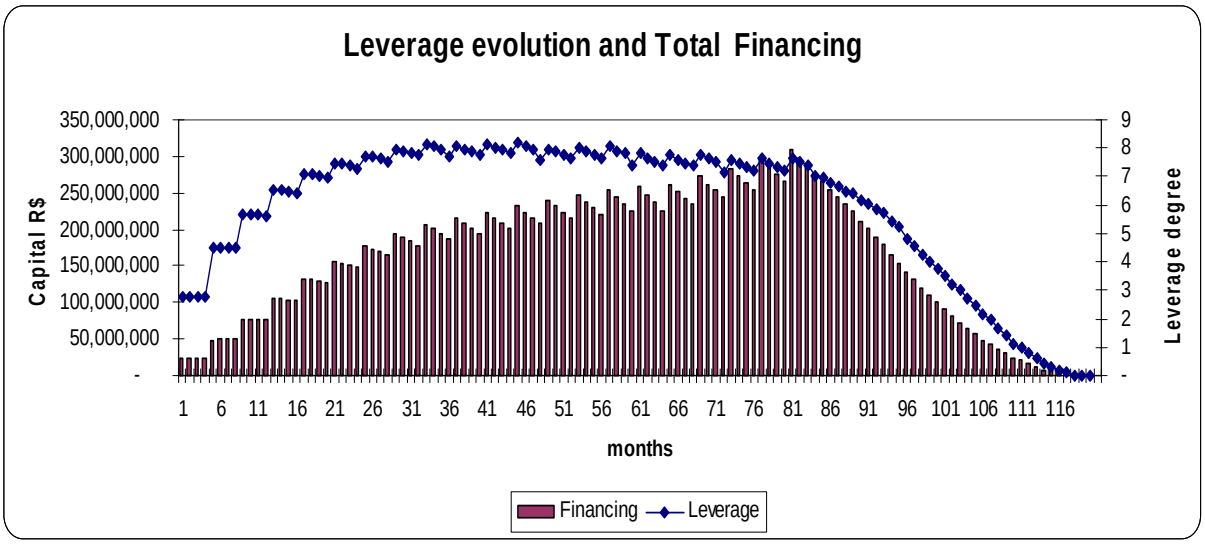
Financial Simulations of the Guarantee Facility

Based on the qualitative model described above, the team prepared a series of simulations to test the financial equilibrium and costs of the Guarantee Facility. The Baseline Case incorporated the following assumptions.

Parameter	Value	Comments
• Simulated lifetime of the Guarantee Facility	120 months	
• Average term of credit covered by guarantees	36 months	
• Grace period of loans covered	12 months	
• Interest rate: TJLP plus bank spread)	14.75% p.a.	Initially, declines 0.5%/semester
	11.00% p.a.	From 48th month on
• Default rate on loans (on monthly basis)	10.0%	
• Recovery of credits in default	2,5%	Initially, increases 2.5%/year
	10%	From 4th year on
• Coverage of guarantee (% of loan principal)	100%	
• Return on reserves of the Facility	1.45% / month	Initially, declines 0.02%/month
	0.90% / month	From 28th month on
• Administration cost of the Facility per month	R$ 80,000	
• Approval cycles per year	Three	Procedure to simplify calculations
• Initial capital of the Facility	R$ 6.5 M	Doesn't effect performance
• Maximum leverage permitted	10	Value guaranteed / capital
• Benchmark return for capital	12.12% p.a.	Liquid government bonds
• Payment of the commission	"Up front"	Capitalized in the loan
• Guarantee commission consistent with above	0.26% / month	Times # of months of loan term

In this Baseline Case, the value of the portfolio of guaranteed projects evolves as shown in Figure **1**, which also shows the leverage of the capital of the Guarantee Facility, month by month. Although the maximum leverage permitted is 10, the maximum leverage effectively achieved is about 8, providing a degree of conservatism.

Figure 1: Value of the Outstanding Portfolio of Guarantees and Leverage of the Facility's Capital



Over the 10-year period the capital evolves as follows in the Baseline Case:

Initial Capital:	**R$ 6.500 mil**
Guarantee Commission:	R$ 66.782 mil
Interest on the cash available:	R$ 28.484 mil
Administrative Expenses:	(R$ 9.600 mil)
Default:	(R$ 78.795 mil)
Default Recuperated:	R$ 7.605 mil
Final Capital:	**R$20.976 mil**

The guarantee commission fee is dependent on the other variables assumed in the model. That is, given the other assumptions, the commission is the fee which allows the benchmark return on the investors' capital. It is defined as a % per month of the value of the loan being guaranteed, multiplied by the number of months of the loan. It is paid "up front" and capitalized in the loan being guaranteed.

In the Baseline Case the guarantee commission is 0.26%/month. This makes the guarantee expensive compared to previous guarantee facilities designed to increase access to BNDES credit (0.15%/month). The impact of the Baseline Case on the implicit cost of the project debt is significant. For a project with a 3 year term, the interest rate of BNDES financing through a commercial bank is 14.43% p.a. Adding the cost of the guarantee would increase this to an implicit rate of 20.19% p.a.

The cost of the guarantee was highlighted as a problem by the ESCOs who participated in the review process. However, even with this high initial cost it would make a significant share of potential projects financially viable. The real comparison is not with BNDES financing – usually unavailable in practical terms – but with the cost of the equity resources of the ESCOs and their clients. In addition, having access to guarantees under clear criteria should reduce the marketing risks and costs of the ESCOs. For them, an initially high cost Guarantee Facility is much preferable to none.

However, it must be emphasized that the Baseline Case is deliberately conservative – especially with regard to the default rate, which is set at the high level of 10% (with a low level of recuperation of accounts in default). The authors believe that a default rate of 5% or less is feasible with the proper evaluation of projects. Assuming a default rate of 5%, the cost of the average commission fee would fall to about 0.15%/month.

A low default rate will depend not only on careful evaluation of the projects but on clear criteria and incentives to stimulate the presentation of projects of adequate quality. For example, it should be possible for the facility to charge different levels of commission depending on the risk of the project (including past performance of the ESCO) and its term.

The cost of the guarantee could also be reduced by assuming a lower benchmark return or by subsidies to reduce the cost of project evaluation. However, in both cases the effect is very small, while reducing the benchmark return diminishes the attractiveness of the Facility to the investor and the credibility of the guarantee.

Subsidies to reduce operating costs, especially in the first several years when all the agents are on a learning curve, could be a more promising approach. Coupled with support to improve procedures, provide training etc, this could be an area for both domestic and international donor support.

In the end, even without these subsidies and using very conservative variables, the proposed Guarantee Facility appears to be financially feasible and to open a significant window for ESCOs' access to the financial market.

The preparations for this report and the review process have confirmed the longstanding priority given to establishing a Guarantee Facility – expressed by ABESCO since 1997. Recent developments in the regulatory environment for commercial banks – Basel II and the new Brazilian Bankruptcy Law – have increased its relevance.

In addition, an investment in a Guarantee Facility would leverage public resources vastly more than most existing programs, which are on a grant basis.

At the review meeting of June 10, held at FIESP, it was agreed that it would be a priority for ABESCO to take a proposal to the government, while continuing existing exchanges with the BNDES and financial institutions.

This report provides an objective reference for these discussions, which hopefully can soon lead to decisions to detail the design of a Guarantee Facility in preparation for effective implementation.

1. The Market for Financing Investments in Energy Efficiency

1.1. Introduction

The potential for investments in energy efficiency projects in Brazil is large, however, these investments by and large do not materialize. There are several obstacles resulting in this shortfall, which described in the following chapter. However, the main barrier is the lack of access to financing. There are two main reasons for the lack of financing: **1.** The ESCO's do not possess a financial structure that would allow the granting of guarantees for financing; **2.** The agents of the national financial system, being unacquainted with operations involving energy efficiency projects, feel uncomfortable in carrying out the financing.

A proposal to reduce this barrier is the establishment of a Guarantee Facility. This Facility would guarantee the financial institutions for the loans granted to the ESCOs for investments in energy efficiency projects. The guarantee provided by the Guarantee Facility would be the mechanism to open access of the ESCOs to the national financial system and would be a form of introducing this type of transaction to the banks.

Initially the Guarantee Facility (GF) would be a key factor permitting the concession of credit for ESCO projects. From the moment when agents in the national financial system become familiar with this type of transaction, the banks should themselves become confident in financing the investment in energy efficiency projects.

The first two chapters describe the current context of the financial sector and of the energy efficiency services' market. The third chapter introduces some considerations concerning the creation of a GF and summarizes Brazilian and international experiences. In the fourth chapter a basic proposal is outlined for the structure and operation of a GF, with quantitative parameters for a reference case. In the fifth chapter there are financial simulations and discussions of the results to test the impact of several assumptions on the viability of a GF from the point of view of the investors in the Fund, of the commercial banks and of the ESCOs and their clients. At the end, in the sixth chapter, some conclusions and recommendations are summarized.

1.2. Financing in Brazil

An energy efficiency transaction is an investment, it involves the acquisition of an asset that will rationalize energy consumption, bringing as a benefit the reduction of the energy bill. In Brazil, there are limited options for investment financing, being that the BNDES (Banco Nacional de Desenvolvimento Econômico e Social – National Bank for Economic and Social Development) and foreign currency transactions are the main sources of resources. For companies of the size of ESCOs, in fact, there is only the option of the BNDES, since the size of the credit necessity of the ESCOs makes any external transaction unviable.

In order to obtain financing through any of these two sources, the company must show that it has good financial health, with potential for growth and a necessity for long term resources to capitalize its market potential.

The Brazilian financial market for small and medium sized companies, the size of the ESCOs, is characterized by short term loans, high levels of spreads and elevated levels of guarantees. There is a necessity for the introduction of a mechanism to allow access by the ESCOs to the market for longer term credit.

1.3. The Financial Market

Brazilian banks operate in a very sophisticated system. They carry out typical bank transactions and also provide services, mainly in the collection of titles and documents. This characteristic is closely linked to the history of high inflation levels in Brazil. During the years of high rates of inflation, a great part of the profits of banks originated from "floating", where the institutions used the resources of third parties without paying any type of compensation.

Another characteristic of Brazilian banks refers to the composition of their assets. The greater part of them are used to finance the large internal debt of the Brazilian government – more than 55% of the GNP. In view of the high interest rates in the country, currently at 19% p.a. for a forecast inflation of 6% p.a., providing finance to the government is currently a highly profitable transaction, with reduced costs and risks, which takes up a significant part of the available resources of the banks.

The volume of credit in Brazil is low when compared with other nations. The relation of credit compared to the GNP is 20%, which is substantially lower than the ratios presented by the developed nations (120%) and by the countries of South-eastern Asia (100%). The main reasons for the elevated spreads, short terms, strong guarantees and low levels of credit are:

- Compulsory applications for rural and habitation related credits
- Elevated rate of compulsory deposit
- Taxation on financial transactions
- High level of default
- Weak guarantees
- Inefficient and slow judicial system, with a tendency to favor the borrower.

To illustrate the difficulty of the ESCOs in obtaining adequate resources to finance their projects, we present below some tables and graphs. The first table (1.3.A.) below summarizes the distribution of financing in Brazil and shows the large participation of the government, by means of the targeted credit, with favorable interest rates.

Table 1.3.A: Distribution of Financing

	R$ Billion				
	Dec/01	Dec/02	jul/03	Sep/03	Dec/03
Targeted	**116,9**	**142,9**	**147,4**	**150,6**	**161,7**
Habitation	21,3	21,6	22,7	22,9	23,1
Rural	26,1	34,7	36,4	39,1	44,9
Other	4,0	1,9	2,0	2,1	2,6
BNDES	65,5	84,7	86,3	86,5	91,1
Non-targeted	**194,1**	**212,5**	**212,7**	**216,0**	**224,2**
Individuals	69,9	76,2	82,5	84,8	88,1
Companies - R$	69,9	79,1	81,0	83,0	88,1
Companies- Foreign	54,3	57,2	49,2	48,2	48,0
Leasing	**11,5**	**9,5**	**8,3**	**8,4**	**9,0**
Government	**9,8**	**13,5**	**14,6**	**15,0**	**15,0**
TOTAL	**332,3**	**378,3**	**382,9**	**390,0**	**409,9**

Source: Central Bank of Brazil

Table 1.3.B. shows the average terms in days of the different types of financing. The longest term is for the external onlending, yet even in this case the term is very short for the financing of investments.

Table 1.3.B: Average Term of Financing

	Days			
	Sep/02	Dec/02	jul/03	Sep/03
Company	**185**	**177**	**175**	**173**
Working Capital	253	238	230	232
Issue discount	37	32	31	31
Guarantees	23	22	23	23
Assets acquisition	276	258	257	263
Vendor	72	70	84	88
ACC	112	100	120	115
External onlending	272	299	290	299

Source: Central Bank of Brazil

Table 1.3.C. shows the different modalities of credit transactions of companies by type of transaction and its conditions. The conditions were divided into the 4 main modalities: pre-fixed, post-fixed, floating and price indexed. The main type of post-fixed is the Dollar, for the floating mode it is the Certificate of Inter-bank Deposit and for the price indexed it is the IGPM (General Index of Prices - Market). The Certificate of Inter-bank Deposit (CDI) was created in the 1980s to be used in the inter-bank market. The average rate of the CDI is an important reference in the Brazilian financial market.

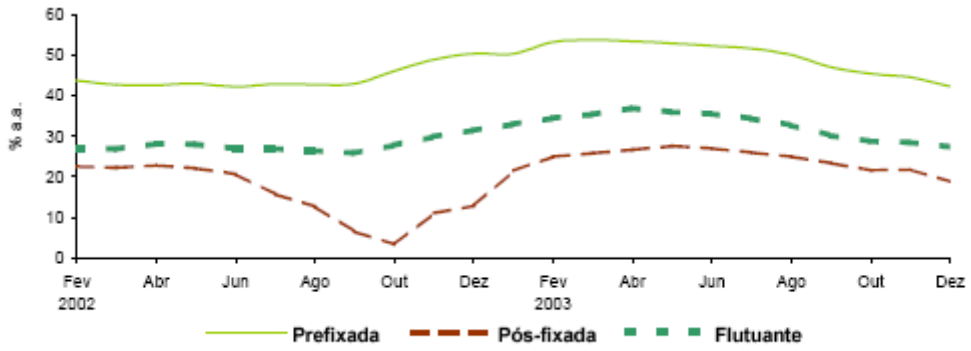
Table 1.3.C: Modalities of Credit and Types of Transaction - 2003
(billions of Reais)

	Working Capital	Guaranteed Account	Acquisition of Assets	Vendor	Hot Money	Desconto Duplicata	Desconto N. P.	Financ. Imobiliário	Repasses Externos	Financ. Exp/ Imp	Outros	Total
Pré Fixado	12,6	10,3	3,9	7,2	0,3	7,5	0,3	0,1	-	-	10,3	52,5
Pós Fixado	2,8	0,0	0,0	0,0	0,0	-	-	0,5	13,9	26,0	8,1	51,4
Flutuante	17,2	11,5	0,7	0,6	0,2	-	-	-	-	-	1,4	31,7
Preços	0,4	-	-	-	-	-	-	-	-	-	0,2	0,6
Total	33,0	21,9	4,7	7,8	0,5	7,5	0,3	0,6	13,9	26,0	20,0	136,1

Source: Central Bank of Brazil

Figure 1.3.D. shows the evolution of the cost of financing during 2002 and 2003. The Dollar showed great variation, reflecting expectations in relation to the measures that would be taken by the next president of the Republic, reaching almost R$4 just before the election in 2002. With the announcement of measures by the new administration, maintaining the strictness of economic policy and respecting the value of the currency, the uncertainties diminished, contributing towards the devaluation of the American currency.

Figure 1.3.D : Interest Rates for Credit Transactions – Companies

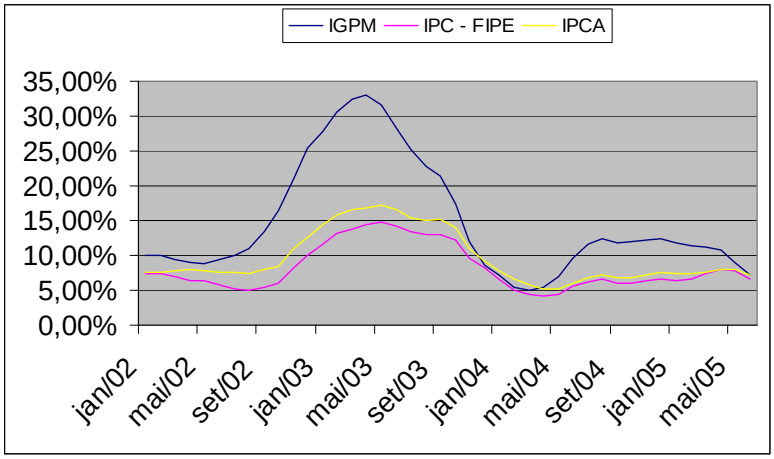


.....Pre-fixed ….Post-fixed ……Floating

Source: Central Bank of Brazil

Figure 1.3.E. below shows the evolution of the 3 main price indexes in Brazil. The IGPM, calculated by Fundação Getúlio Vargas, is the most frequently used to index contracts involving price readjustments. The IPC is calculated by FIPE (Fundação Instituto de Pesquisas Econômicas – Institute of Economic Research Foundation) of USP (Universidade São Paulo – University of São Paulo) and the IPCA is calculated by IBGE (Instituto Brasileiro de Geografia e Estatística – Brazilian Institution of Geography and Statistics). The IGPM gives greater weight to wholesale prices (70%), whereas the IPC and the IPCA are indexes for prices for the consumer.

Figure 1.3.E : Price Indexes



In comparing the graph of the cost of financing (Figure 1.3.D.) with the different inflation indexes shown above, a great difference is verifiable between them. This difference shows the elevated cost of money in Brazil, a country which is always amongst the nations with the highest effective rates of interest in the world, as seen before, currently at 13% p.a.

The cost of money together with the short terms evidences the inadequacy of resources, in Brazil, for the financing of investments. Amongst the existing alternatives, only the BNDES and foreign currency loans have the potential of providing capital for project investments loan, being that obtaining external funds is unviable for small companies.

1.4. National Bank of Economic and Social Development (BNDES)

The BNDES (*Banco Nacional de Desenvolvimento Econômico e Social*) is the main vehicle of the federal government for financing development and is also the main source of financing of long term resources in the Brazilian financial market. BNDES offers resources directly or indirectly through accredited financial agents (banks).

With total assets of R$152 billion on December 31, 2003 and a disbursement of R$35 billion in 2003, BNDES is the main Brazilian institution whose principal activity is financing since its creation in 1952. BNDES finances public and private companies, national capital or not, with focus in the following areas:

- Industrial modernization;
- Infrastructure;
- Development of exports;
- Social development;
- Micro, small and medium-sized companies;

Of the total assets of 2003, loans represented R$ 119 million, distributed as follows (R$1,000):

Table 1.4.A : Distribution of Loans

	Foreign Currency	Reals		
	Moeda Estrangeira	Reais	Total	%
Setor Público	3.866	15.311	19.177	16,1%
Setor Privado	33.394	66.244	99.638	83,9%
Total	37.260	81.554	118.815	100,0%
%	31,4%	68,6%	100,0%	

Source: Central Bank of Brazil

The loans of BNDES are destined to finance investments in fixed assets and the necessary working capital. The portion of associated working capital is calculated as a function of the specific needs of the enterprise, up to the following limits, relative to the fixed investment susceptible of financing at *BNDES Automático* (Automatic BNDES) (up to R$ 10 million)

- Micro companies: up to 50%;
- Small Companies: up to 25%;
- Medium-sized Companies: up to 20%;
- Large Companies: up to 15%.

The term of financing or investments in energy efficiency projects varies, being that transactions of up to 8 years are possible, with a grace period of up to 2 years and beginning of amortization with the beginning of operation of the project. Interest rates are paid quarterly and the principal every semester or even annually. During the grace period the interest is capitalized. The financing covers up to 80% for machinery and equipment, and 60% for other items. For micro, small and medium-sized companies the percentage may reach 90% of the value of the project. A micro company has an annual gross revenue of up to R$ 1.2 million, a small company up to R$ 10.5 million and a medium-sized company up to R$ 60 million.

The loans can be made within the Automatic modality or through the FINEM. Those of up to R$ 10 million, necessarily have to be made through the Automatic mode, which requires the participation of an intermediary agent. Loans exceeding R$ 10 million may be obtained through an Agent or directly with the BNDES; the option is at the discretion of the borrower. The BNDES accredits the financial institutions to be its agent. The great majority of financial institutions incorporated in the country are accredited by the BNDES; all 15 of the largest banks are. When the financing is done by an agent, the credit risk of the resources of the BNDES is a responsibility of the bank.

BNDES limits its financing to 25% of the liquid assets of the borrower and does not finance:

i. Acquisition of land and its improvements.
ii. Used machinery and equipment.
iii. Imported machinery and equipment.

The financial cost of the loan is given by the formula below, where the interest rate is the TJLP or the basket of currencies:

Financial Cost: Interest + BNDES Spread + Agent Spread

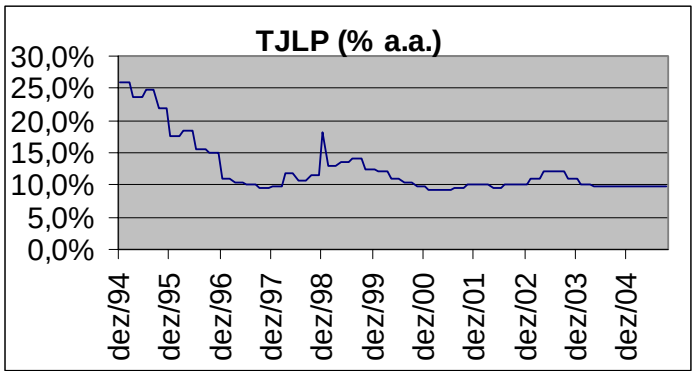
1.4.1. TJLP

The TJLP (Long Term Interest Rate, *Taxa de Juros de Longo Prazo*) was created in 1994 by the Brazilian government as being the basic financial cost of BNDES. The aim of its creation was to support the long term financing for investments in fixed capital. The rate does not include any risk component, either of the BNDES / Agent or of the borrower. The TJLP has two basic components:

Inflation: inflation estimated for the next 12 months.
Risk Factor: international interest rate + Brazil risk

The TJLP is fixed quarterly by the National Monetary Council to remunerate the loans of the BNDES in national currency. Currently the TJLP is set at 9.75% p.a., the graph below shows the evolution since its creation.

Figure 1.4.1.A: TJLP between 1994 and 2005



The table below shows the evolution of the annual average of TJLP:

Year	TJLP
1.995	23.4%
1.996	16.0%
1.997	10.1%
1.998	11.7%
1.999	13.2%
2.000	10.7%
2.001	9.5%
2.002	9.9%
2.003	11.5%
2.004	9.8%
Average	11.5%

1.4.2. Basket of Currencies

The basket of currencies is used when the origin of the resources for financing is external, in foreign currency. The cost of the basket of currencies includes:

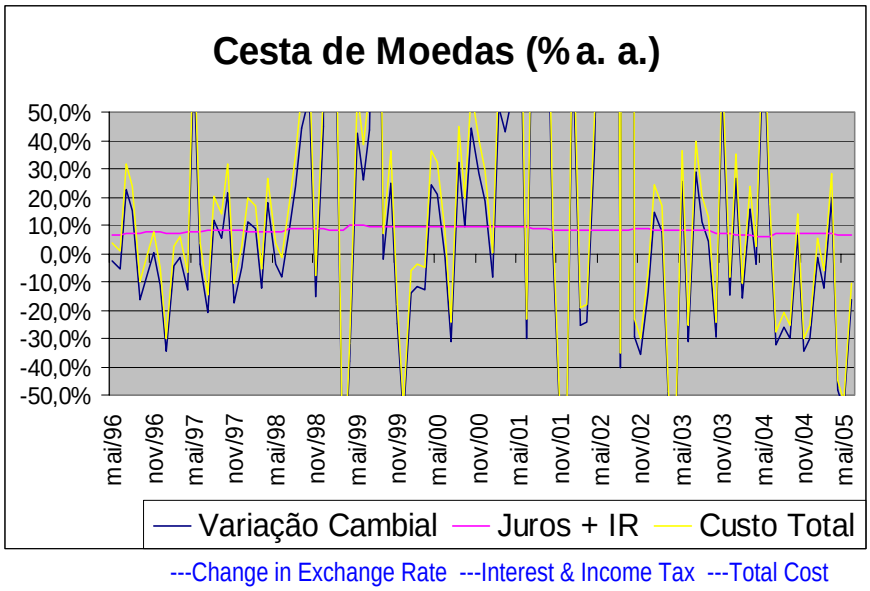
i. UMBNDES (initials in Portuguese for Currency Unit of the BNDES - *Unidade Monetária do BNDES*): average of the currency variation of the currencies used by the BNDES in its external raising of funds, weighted by the volume of resources used. In September 2004, the composition was: US$: 84%, Yen: 10% and Euro: 6%.

ii. Average weighted interest rate of all non-tax fees and expenses, incurred by the BNDES in the raising of external resources, calculated quarterly.

iii. Income Tax: equivalent to the average weighted income tax, levied upon interest paid by BNDES to external creditors, also calculated quarterly. The rate is of 15% for the great majority of countries and 25% for tax havens.

There is an ample flotation of the basket of currencies when compared to the Real, with a maximum of +58% per month and a minimum of -17% per month. The figure below shows the evolution of the UMBNDES limited to a variation of +/- 50%:

Figura 1.4.2.A.: Fluctuation of the Basket of Currencies (% p.a.)



The table below shows the annual cost:

Year	Total Cost	Currency Variation	Interest + Income Tax
1.996	5,6%	-1,5%	7,2%
1.997	5,5%	-2,1%	7,7%
1.998	21,7%	12,5%	8,1%
1.999	58,2%	44,7%	9,3%
2.000	16,5%	6,5%	9,4%
2.001	24,2%	13,9%	9,0%
2.002	69,2%	56,0%	8,4%
2.003	-8,9%	-15,7%	8,1%
2.004	-1,2%	-7,4%	6,7%
Average	28,0%	18,7%	8,2%

As can be observed, when comparing the TJLP and the basket of currencies, TJLP presents a lower cost. Besides the lower cost, there is a smaller variation, which means a smaller level of risk. Normally, there is a preference for loans fixed at the TJLP by the borrower of resources. Two are the main reasons for this preference: 1. Lower cost; 2. The cash flow of the borrower, to fulfill the obligation assumed before the BNDES, is usually in Reals, and there is no need to make a hedge for protection from currency fluctuations.

When the cash flow to be generated by the investment financed by BNDES is in foreign currency, the borrower may give preference to the basket of currencies. In fact the basket of currencies is used when the borrower of resources is a company with external owners, or when the company requests financing for exports (Proex).

1.4.3. Spread

Besides the interest rate - TJLP or basket of currencies - there is the cost of the spread:

i. **BNDES Spread** remunerates the operational cost of the Bank and if the operation is direct, the credit risk. The spread varies between 1 and 4.5% per year. Usually the spread is about 3% per annum.

ii. **Agent Spread** is the remuneration for credit risk and for covering the operational costs of the financial institution. The spread varies between 1 to 4.5% per annum.

1.4.4. Guarantees

The Operational Policies of the BNDES System, seeking to encourage the accredited banks to ease credit access to small and micro companies, has been systematically establishing measures which make transactions with this sort of company viable. The creation of the Guarantee Facility (Guarantee Fund for the Promotion of Competitiveness *Fundo de Garantia*

para Promoção da Competitividade – FGPC) and the end of the requirement of collateral by the financial agents for credits of up to R$ 500,000 were some of the measures undertaken.in this sense.

In the operations of FINEM, BNDES Automatic and FINAME it is possible to utilize the FGPC, subject to limitations of the maximum risk assumed by the FGPC and of the size of the company and the region where it is situated. It should be emphasized that in all transactions of BNDES, including for Rural Finame (*Finame Agrícola*), the stipulation of the Operational Policies is that "guarantees shall be negotiated between the accredited financial institution and the client".

The great majority of the transactions of the ESCOs have a value of less than R$10 million. They are therefore classified in the Automatic modality; that is, financing shall be carried out through a financial agent, accredited by BNDES. Under this condition, the responsibility of the credit shall be of the financial agent, which shall be remunerated by a spread for the risk of the transaction.

It is important to point out that in this "negotiation" suggested by BNDES, the offering of collateral remains a frequent requirement by the accredited financial institutions, being that such collateral usually consists of the trust receipt of the equipment, besides the personal guarantees rendered by the partners of the company. Therefore, even in transactions of BNDES by means of accredited institutions, the ESCO should, besides demonstrating its creditworthiness (by means of traditional risk analysis – character, capacity, capital, conditions and collateral), present options of assets to offer as trust receipt as collateral, as well as personal guarantees involving the assets of the shareholders of the company. Certainly this has been an inhibiting factor of access of micro and small companies to credit from the BNDES System.

With respect to the question of guarantees in the operation of the conventional commercial banks in the Brazilian market we may claim that in the majority of working capital transactions and in the totality of investment transactions there is the presence of real guarantees (mortgage, trust receipt, pledge or bond) besides the personal guarantee of the shareholders.

When focusing on small and micro companies we can see a preference in working capital transactions for receivables (accounts receivable, checks and bills) creating operations for the discounting of such paper. Besides this discount, however on a smaller scale, Brazilian commercial banks also act with guarantees of credit (*caução de títulos*), usually in guaranteed accounts with characteristics of rotational limits. In investment transactions the offering of real guarantees is required in addition to the personal guarantees rendered by the shareholders and sometimes by the managers.

We can thus see the near impossibility of investment operations or even medium term working capital operations with ESCOs within the current financing structure, be it through the institutions accredited by BNDES or directly with commercial banks, due to the difficulty that they have in the presentation of guarantees.

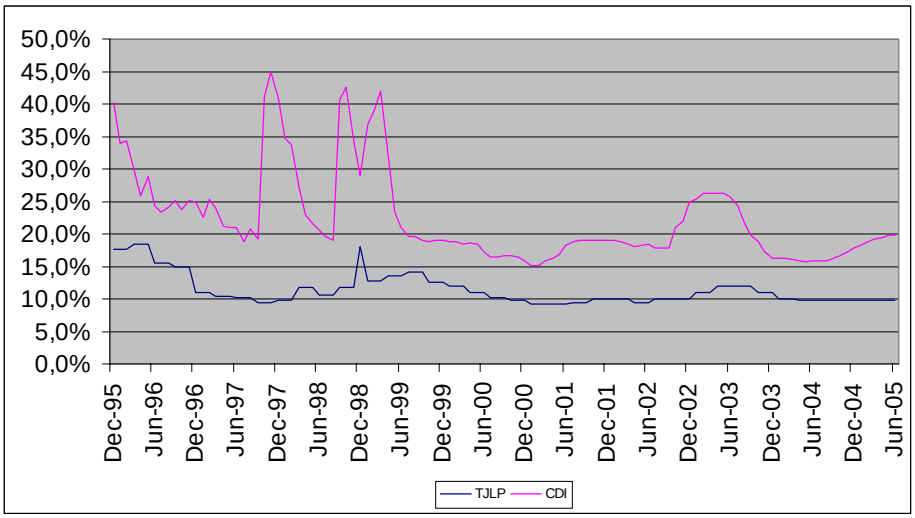
1.5. Commercial Banks

The low level credit when compared to the Brazilian product, demonstrates the difficulty for a company to obtain financing in the country, the offered alternatives are basically short term with

strict guarantees. For larger companies, there is the possibility of obtaining financing for the longer term, but this will be in foreign currency and with even heavier guarantees. As observed above, a relevant part of the short term financing is indexed to the CDI.

The graph below compares the CDI and the TJLP. Though the two curves having a similar behavior, the CDI is consistently higher than the TJLP. The CDI varies in accordance with the monetary policy defined by the Central Bank, whereas the TJLP behaves in accordance with the financing rate defined by the National Monetary Council.

Figure 1.5.A.: TJLP Compared with the CDI



The table below shows the annual average of the CDI and the TJLP. The average difference between the two rates during the last 9 years has been 10% p.a., which makes it clear that the TJLP is the best alternative for financing investments.

Ano	CDI	TJLP	Diferença
1.996	26,9%	16,0%	9,4%
1.997	26,4%	10,1%	14,8%
1.998	28,6%	11,7%	15,2%
1.999	25,5%	13,2%	10,8%
2.000	17,4%	10,7%	6,0%
2.001	17,6%	9,5%	7,4%
2.002	19,3%	9,9%	8,6%
2.003	22,8%	11,5%	10,2%
2.004	16,3%	9,8%	5,9%
Média	22,2%	11,4%	9,8%

1.6. External Loans

An alternative to the BNDES for investment financing is the transfer of foreign currency. Within this alternative, banks obtain resources in the international market, transfer the resources to their clients collecting a spread, which is the sum of administrative costs, of the credit risk and of the profit. In view of the type of operation and its transaction cost, this alternative is viable only for financing of operations with large values. Usually, the conditions are:

- Term: 7 years
- Grace period: 18 months
- Currency: US$
- Interest: LIBOR + 5.5% p.a.

A typical operation of transfer has a cost of currency variation + 13.9% p.a. (LIBOR (3.8%), Interest (5.5%) + Agent Spread (4.0%))

Brazilian financial administrators are very cautious with regard to owing resources in foreign currencies, unless the company has a natural hedge. In this way, when a company takes a loan in a foreign currency, in order to avoid the risk of a devaluation of the currency, a hedge is made. The most common hedge is a swap, where the "Foreign Currency + LIBOR + Interest" is transformed in Reals indexed by the CDI.

On June 27, 2005, the CDI closed at 19,72% p.a. and the average rate for a swap transaction on the same date, issued by Andima, was 5.99% p.a. for 1800 days (5 years) and 5.49% p.a. for 1080 days (3 years). Taking into account the cost of a foreign loan with currency variation plus 13.9% p.a., we have the following swaps[1]:

1080 days: 27.8% p.a.
1800 days: 26.3% p.a.

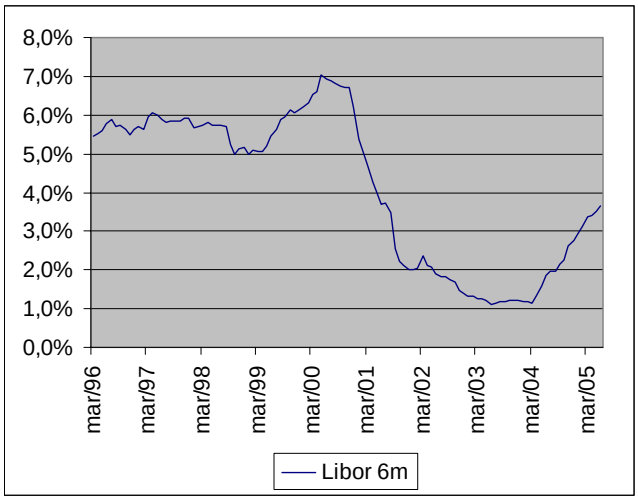
These rates are very superior to the CDI which in turn is higher than the TJLP, which explains the strong preference for the resources of the BNDES.

The hedge only partially protects against the external factors of a loan in foreign currency, for these reasons: **1.** For contracts with longer terms, there is no liquidity. For such terms, the volume of business is very much reduced; **2.** Difficulty in making a perfect hedge due to the term. The term of the external contract does not coincide with the term of the hedge; **3.** Necessity of making a hedge for LIBOR, not to run the risk of a fluctuation. There is also the question of income tax which may be levied in the case of a positive hedge, whose value is impossible to forecast and therefore to estimate how much will be earned.

Below is presented the LIBOR for 6 months, where it can be observed that, after having reached a minimum in 2003, the rate already shows a tendency to rise. The rise of the LIBOR reflects a more restrictive monetary policy in the main economies, which has also led to an increase in the interest of external loans.

[1] ((1 + CDI) ^ n / (1 + swap * n) * (1 + loan cost * n)) ^ (1 / n)

Figure 1.6.A.: LIBOR Rate



Added to the increase in the LIBOR, there is an expectation of a decrease in the CDI. The estimate of the market report of the Central Bank, of December 30, 2004, is that the CDI at the end of 2005 will be 15.50% p.a. The report of the Central Bank, which represents the average of the future expectations of the main financial institutions and economic consultancies in Brazil, presents the following forecasts for inflation in 2005: IPCA: 5.7%; IGPM: 6.6%; IPC-FIPE: 5.3%. Notwithstanding the expected reduction of the CDI, the effective interest rates will remain extremely high, which allows us to expect more significant reductions in the CDI for future years. The reduction in the CDI will probably be accompanied by a reduction in the TJLP.

The reduction of the internal interest rates and the increase in the external interest rates, including LIBOR, should increase the difference between the costs of these two types of loans, in favor of the local operations.

This introduction to the structure of the Brazilian financial market aimed to explain the preference of the ESCOs for BNDES loans for the financing of energy efficiency projects. The proposal of this paper is to develop a mechanism to allow the ESCOs to meet the conditions to obtain BNDES resources.

1.7. Credit Market – risk evaluation and classification

In December 1999, the Central Bank of Brazil determined that the financial institutions operating in Brazil should classify their credit operations in 9 different categories (AA - H) according to the risk of operation and the risk of the client.

The borrower is appraised based on its:

1. Financial situation
2. Level of debt
3. Capacity of Cash Generation;
4. Management;
5. Internal and external controls;
6. Existing Debts;
7. Contingencies;
8. Sector of activity;
9. Credit Limit.

The operation is appraised based on:

1. Nature and objective of the operation;
2. Guarantees;
3. Value.

For each risk zone it is necessary to make a provision for default, in accordance with the following table:

Zone	Provision
AA	0.0%
A	0.5%
B	1.0%
C	3.0%
D	10%
E	30%
F	50%
G	70%
H	100%

The financial institutions are interested in financing clients and/or operations classified as AA, A, or B. A bank does not take part in an operation classified as C, unless a guarantee is provided, which allows an improvement in the classification to AA, A, or B. Considering that the ESCOs, as well as their energy efficiency projects, are not classified as AA, A or B, there is great difficulty in obtaining financing. It is necessary to create a mechanism which, when linked with the operation, would raise its ”rating” and consequently decrease the necessity for capital of the bank supplying the credit. This paper seeks to develop precisely this mechanism.

1.8. Impact of the Regulatory Alterations of Commercial Banks

1.8.1. Basel

Concerning the credit risk regulations which will be implemented in Brazil under the guidelines of Basel II, the proposed guarantee facility (GF) would be of primary importance in the reduction of credit risk, diminishing in this manner the requirement of greater capital by the commercial banks. As the GF would have an excellent rating by the regulatory bodies, there shall be a great reduction in the likelihood of default in the operation (comprised of the risk characteristics of the client – *obligor* risk – plus the characteristics of the offered guarantee).

1.8.2. Bankruptcy Law

The bankruptcy law recently approved (09/03/2005) strengthens the position of the banks in the recovery of debts and shall cause the banks to require even more real guarantees given their privileged position in recovery.

This law has as its main characteristic the creation of the process of extrajudicial recovery, prior to judicial recovery and to bankruptcy. There shall be a period of 180 days for reaching an agreement concerning the eventual recovery of the company. If this agreement is not reached, the case will be taken to the judiciary.

Another point which deserves attention, and which is probably of greater interest for this report, is the order established for the recovery of assets from a company in financial difficulty or bankrupt. Before this law, the privileged creditors (with real guarantees) were placed in fourth place behind labor debts with employees, tax debts with Federal, State and local governments, in this order, and the debts that the bankruptcy trustee assumed in the administration of the chapter 11 proceedings. By the new bankruptcy law the position of privileged creditors is changed to second, only behind labor debts with employees, now limited to up to 150 minimum salaries per employee. It should also be emphasized that the amount of the privileged credit has a limit up to the value of the guarantee.

As a result of this law it will be possible for the banks to effectively recover a greater share of the real guarantees due to their privileged position in the recovery of credit. On the other hand, there may also be a greater supply of credit, however with an increase for the pressure for real guarantees, which certainly will not favor ESCOs.

2. The Energy Efficiency Services Sector

There is great ineffciency in the use of all types of energy in Brazil, as in other countries. This sub-optimization results in an energy consumption that is substantially greater than would be necessary. In the case of electricity, an estimate by Eletrobrás is that this loss is equivalent to 11 GW or 47 TWh.[2] By way of comparison, in 2004, the maximum demand on the national grid was about 57 GW, total consumption of electricity was about 360 TWh and total generation for the grid by all non-hydro sources was only about 41 TWh. When comparing consumers' efficiency gains with generation, technical distribution losses must also be considered.

The supply of energy requires large investments - it is one of the most capital intensive sectors in relation to added value - and is usually associated with negative environmental impacts. Consequently, rationalizing the use of energy not only brings benefit to the immediate consumer, but also to the general economy of the country – that is, there are large "positive externalities". In the case of Brazil, which has had low levels of internal savings and of investments, as well as a high rate of unemployment, the benefit of re-allocating investments in energy supply to other less capital intensive sectors merits emphasis.

The rationalization of energy use confronts diverse market barriers which vary amongst the sectors of consumption. The policies to reduce or overcome the barriers also vary from sector to sector. Minimum efficiency standards and the dissemination of information (such as appliance labels) seem to be effective policies for certain types of equipment and certain market segments, especially in the residential sector.

For an important group of consumers in the productive sector and in the public sector, a solution is the outsourcing of energy rationalization to companies specialized in providing this type of service. Generally these are not the companies with the largest consumption of energy and most intense use of raw materials, for whom the management of energy is already a strategic competence of the company.

The main market for outsourcing is comprised of medium-sized consumers (in energy terms, they may also be large companies) for whom energy rationalization is a specialized question remote from their core competences. It is a large market in terms of the volume of energy consumed per year. At the same time, the average price paid is substantially greater than that paid by the largest consumers.

The companies which provide the energy efficiency services are called ESCOs (*Empresas de Serviços de Conservação de Energia* in Portuguese).

2.1. Characteristics of the Sector

The sector of services for rationalizing the use of energy is diverse and the information concerning its characteristics is fragmented. In order to diminish this problem, in January 2005 ABESCO organized a survey with associated companies as a part of the project supporting this

[2] Cover article of *Jornal Globo*, "Energia que vai pelo ralo" ("Energy down the drain"), January 9, 2005.

report - “New Mechanisms of Financial Intermediation for EE Projects”.[3] This survey serves as an updated reference, even though incomplete. The effort to create new financial instruments will require improving the amount and quality of information available about this sector.

The majority of the ESCOs are small sized companies, with less than 10 employees and annual revenues below R$ 2 million per year. However, there are some medium-sized companies, with revenues exceeding R$ 10 million and more than 20 employees.

There are dozens of engineering companies providing services in this area; however a much smaller number, maybe a dozen, are more organized to execute the several activities expected from an ESCO. Very few ESCOs are subsidiaries of larger companies. The expectation that several energy utilities would create subsidiaries for this market did not materialize – there are only 2-3 operating currently.

There are some companies which have been acting in this area since before 1990, but the majority started operations after 1995. The association representing the companies (ABESCO) was created in 1997. It is, therefore, a relatively new sector.

It is also a relatively small sector. It is estimated that the annual revenue of the sector for efficiency projects has grown from US$ 12 million in 1996 to US$25-30 million on the eve of the energy crisis of 2001-2002 and currently is at the level of R$ 80-90 million (US$30-35 million). However, estimates are not precise and not all efficiency services companies are included – especially in the area of co-generation.

A strategy used by many companies is to diversify the services provided. Many efficiency projects incorporate other rationalization measures which may add value to the project. They treat energy rationalization in the broad sense, rather than energy efficiency strictly defined, with measures such as: (a) the reduction of the maximum electricity demand and the energy load management; (b) correction of reactive energy in order to avoid penalties, (c) generation of peak load power. Some companies also provide services in areas such as: environmental controls, facility maintenance, electrical installations and the rationalization of water use. A question for a Guarantee Facility concerns whether the investments in a project in measures besides energy efficiency should be covered by the guarantee (see subchapter 4.2).

In relation to efficiency itself, the main focus of the ESCO sector is the end use of electricity. However, a substantial portion of the ESCOs have the capacity to work with fuels and thermal systems. In this category are included projects of co-generation of electricity and process heat. The expansion of the use of natural gas should increase the market for fuel-related services.

A significant number of companies are specialized in certain economic sectors or sub-sectors. The advantage of this strategy is that each sub-sector has some distinct characteristics which repeat themselves in certain ways. A company specialized in this sub-sector will spend less time and resources identifying measures that are economically viable.

There are ESCOs operating in all the five major regions of the country. The largest market is, by far, the Southeast, followed by the South and Northeast. The great majority of the ESCOs operate solely in 1-2 regions of the country, but there are some companies which reach 3-5 regions.

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[3] ABESCO and A.D. Poole: *Análise dos Resultados da Pesquisa das Empresas de Serviços de Eficiência Energética no Brasil*; (*Analysis of the Results of the Research of Energy Efficiancy Services Companies in Brazil*), February 2005. Available at the website of ABESCO

2.1.1. Profile of the Projects

ESCOs implement projects with diverse characteristics, both in terms of the technologies used as well in the size of the projects and the terms of the agreements. There is not a "typical project", there is a spectrum of distinct segments.

The survey by ABESCO cited above asked about the minimum and maximum size of projects implemented by the company. In the answers, the minimum values varied between R$20 thousand and R$500 thousand. The maximum values varied between R$300 thousand and R$8 million.

It was also found that there is a considerable variation in the terms of simple payback of the projects, with minimum terms of 6 to 24 months and maximum terms between 8 months and >60 months.[4] In relation to the average term of bank financing needed to support a typical project today, the answers indicated an average size of 36.3 months, but there was also a great dispersion of values.

Certainly there is an important segment of small projects (less than R$ 100 thousand), with short simple paybacks, say of 12-15 months or less. Such small projects may not be apt for a Guarantee Facility, a question which shall be treated further on. However, larger projects with longer terms also form part of the portfolios of ESCOs today.

It is important to remember that the profile of implemented projects today is partly the result of the lack of access to financing from third parties. The investment is made generally with resources of the ESCO, of the client or, sometimes, of a utility. With access to financing it is likely that the characteristics of the proposed projects will also change.

The ABESCO survey asked about the impact of having greater access to financing as a result of establishing a Guarantee Facility. There was a consensus that the volume of business would expand significantly in a relatively short time. The expected average expansion of business was of 95%. The smallest estimate was 20%, the largest, 200%.

From the average point of view of the ESCOs which responded, this expansion would come in the first place as an increase in the number of implemented projects. The majority also considered that the average size of the projects would increase – on average by ~100%. In relation to the projects' simple payback time and the average term of project financing, the answers showed uncertainty, with an inexpressive tendency to increase.

In relation to the several questions about the impacts of access to financing on the business, it is possible that most ESCOs do not have a clearly formed opinion. After all, it is a merely hypothetical possibility, whilst the companies need to survive in the current scenario.

[4] The term of simple payback is the investment of the Project divided by the monthly economy.

2.2. Modalities of Contracting the Services

2.2.1. Types of Contracts

The majority of the projects of ESCOs in Brazil today are implemented as service agreements typical of engineering companies.

However, the concept of the ESCO is strongly linked to a type of contract, called a performance contract, where the ESCO offers a more explicit and stronger guarantee of the results of the project. A Performance Contract is that where the provider of the service commits to design and install — and, in specific cases, operate and maintain — a series of measures in an industrial, commercial or building installation which guarantees an economy in the use of energy. The full remuneration of the service provider requires that it reach the guaranteed levels of economy – verified in a manner agreed upon with the owner of the installation. Basically, the ESCO assumes the "project risk".

The objective of the agreement is to achieve an economy through the rationalization of the use of energy or water — the value of which will be used to amortize, over the time of the contract, the financing obtained for the project. In other words, under normal conditions, the client will not disburse any amount during the implementation of the project.

There are many variants of performance contracts. However, for the purposes of this study, they may be reduced to three basic options. In all three the ESCO guarantees the technical achievement of the project and the fulfillment of the specifications with the consumer/client.

A. The loan is assumed by the client – the traditional model is known as Guaranteed Savings.
B. The loan is assumed by the ESCO – the traditional model is known as Shared Savings.
C. The financing is made through a SPC (Specific Purpose Company) created specifically for the project.

Options **A** and **B** are traditional for performance contracts. Until today the use of Option **C** in energy efficiency projects is rare worldwide, notwithstanding being a common structure for large projects in the energy sector. Figures **2.1-3** below show the flows of payment and other relations between the agents in each Option.

Figure 2.1.: Relations between Agents in Option A (Guaranteed Savings)

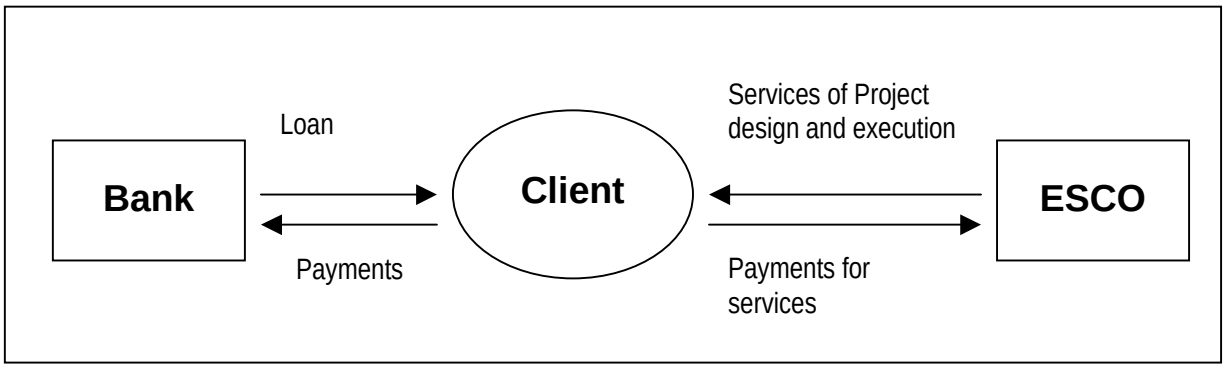


Figure 2.2.: Relations between Agents in Option B (Shared Savings)

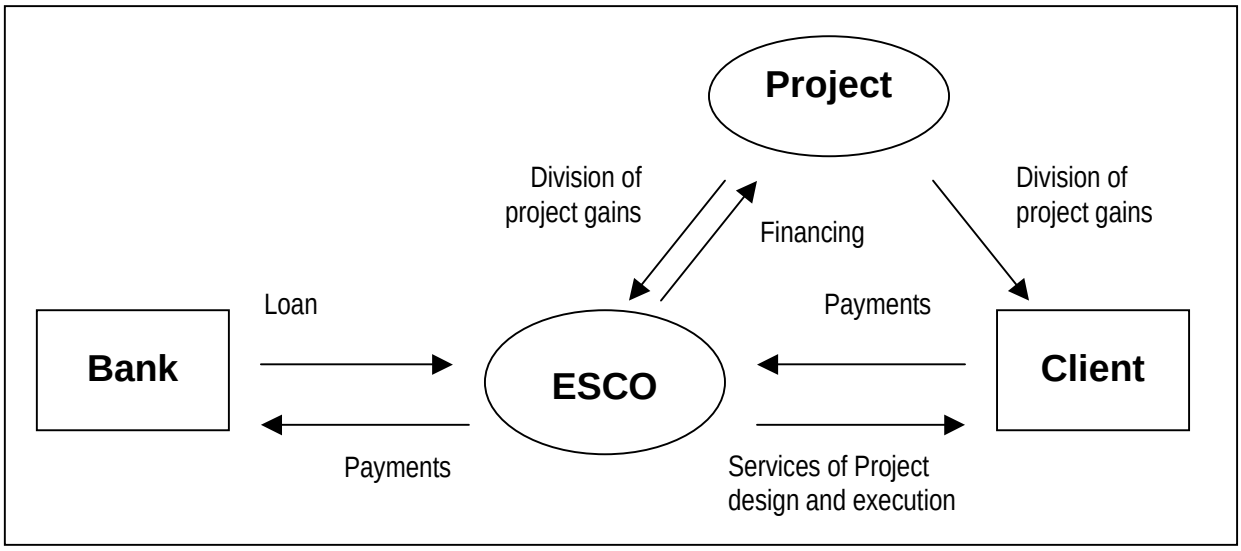
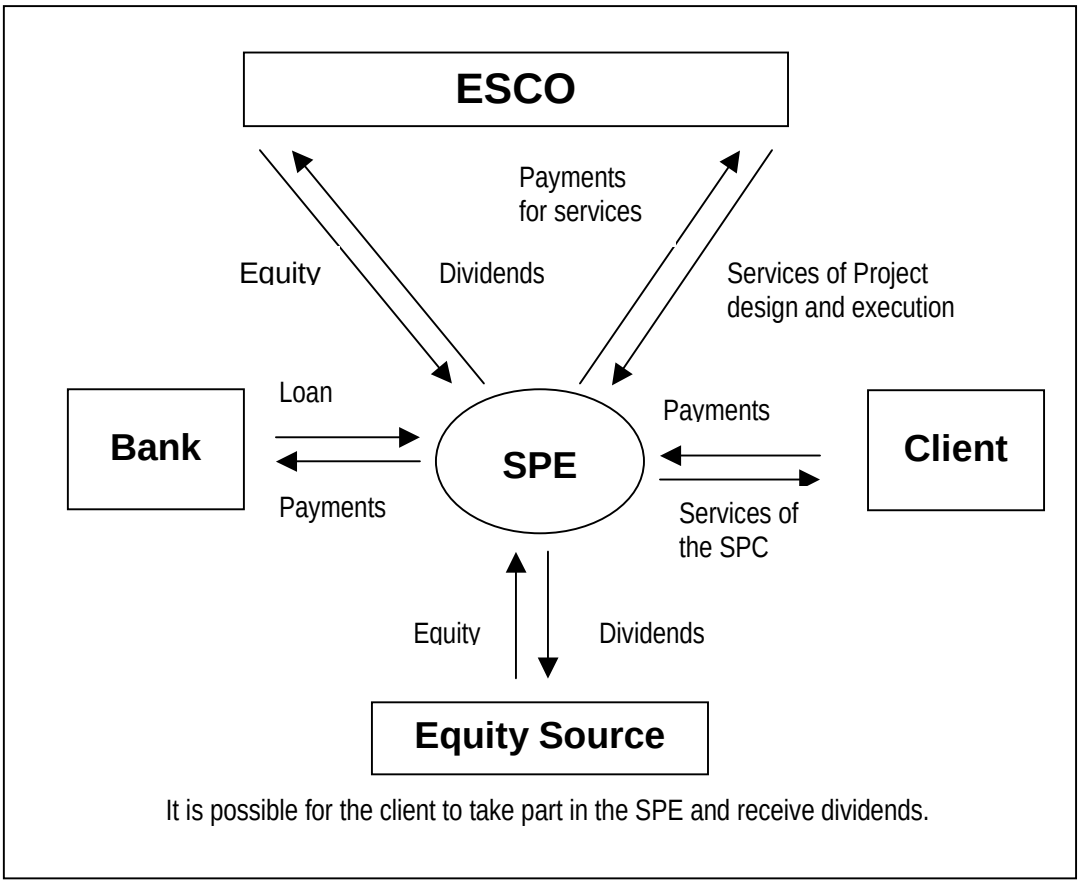


Figure 2.3.: Relations between Agents in Option C (SPC)



The characteristics of options **A** and **B**, seen from a financial perspective, are summarized in table **2.1**.

Table 2.1: Basic and Historic Characteristics of Options A and B

Option A: Traditional Guaranteed Savings	**Option B: Traditional Shared Savings**
• ESCO assumes only the risk of technical performance • Client assumes the credit risk and the assets, irregardless of the performance of the ESCO • Performance defined in terms of the physical reduction of the use of energy • The value of the gains with the minimum stipulated energy price is sufficient to service the debt.	• ESCO also assumes credit risk and assets • Investment is off client's balance sheet; may be structured as a lease. • Performance defined in terms of reduction of the cost of energy • Value of the payments to the ESCO linked to the price of the energy

Option **B** (including the traditional Shared Savings) has attractions as a marketing instrument of the ESCO. From the point of view of the consumer, there are two attractive characteristics:

1. The ESCO assumes the financing. This may be very attractive for the client, even if the capital cost for the ESCO is nominally higher than the cost for the client. In the private sector, the majority of companies avoid taking loans for this kind of investment, in order not to compromise their capacity to provide the guarantees needed for loans. For example, loans are not used for building retrofits. In the public sector, budget restrictions may hinder resource allocation.

2. For potential clients the performance guarantee is much stronger. In most of the Guaranteed Savings contracts (Option **A**) the client has the responsibility of paying the service of the debt, irregardless of the performance of the ESCO. In Option **B** the ESCO may only bill if it shows the guaranteed results.

From the point of view of the ESCO there are advantages besides this appeal to the consumer. By introducing a financial service, Option **B** pulls the operation upwards in the value chain and reduces the risk of the potential client abandoning the negotiation of the project, taking with him the ideas in the audits.

However, there are important disadvantages in the traditional Shared Savings model.

- The more obvious difficulty of Option **B** is that it limits the growth potential of the ESCO. A relatively small volume of projects saturates the capacity to contract debt and therefore finance new projects. The classical means of diminishing this problem are not very attractive. This difficulty highlights the importance of the Guarantee Facility for this option. The GF would assume the credit risk, allowing the ESCO to achieve a greater leverage of its capital.
- At the same time, in Option **B**, the ESCO assumes greater risks in relation to the client's credit. In the traditional form of Shared Savings the ESCO is also exposed to the risks of energy prices, while variable payments open more possibilities for disagreements between the client and the ESCO.

However, to structure a project within Option **B**, it is not necessary to use the traditional Shared Savings model. The ESCO, for example, does not have to assume the risk of the energy price.

Payments do not have to be variable, depending on the results, etc.[5] As has been observed, the existence of a Guarantee Facility should, in principle, relieve the capital restriction as a limit for the ESCO using Option **B**.

2.2.2. Use of Performance Contracts

The original models of performance contracts come from North America and Europe. The adaptation process is still not finished. It involves legal and tax issues, as well as the characteristics of the "business culture" in Brazil.

However, the ABESCO survey cited above suggests that the use of performance contracts is already relatively common. Almost ¾ of the companies claim to have implemented a performance contract in at least one sector. Some affirm having implemented in more than one sector. The greatest experience is with the commercial and industrial sectors. The public sector has been presenting problems for the pubic tendering of projects with performance contracts.

Over half of the ESCOs that have already implemented performance contracts claim to have closed their first contract of this type before 2001. Even more interesting is that, among those companies that have already implemented a performance contract, it has become an important modality of contracting and even dominant for some companies.

The results suggest that the use of performance contracts is more common than is generally recognized. The concept and its application are no longer so "exotic". There is an accumulating national experience which is little known and must be studied.

At the same time, it is recognized by the ESCOs that the process of improving the agreements and their negotiation and execution must continue. This project of the World Bank is collaborating with the efforts of ABESCO and of other agents to improve capabilities.

2.3. The Market Potential

There are no systematic studies of the market potential for ESCOs – only some very simplified calculations. However, there is no doubt that there is a large "inventory" of projects with attractive rates of return. The ESCOs today merely scrape this "economic potential" which would support an annual volume of projects several times larger than the currently estimated level of R$ 80 - R$ 100 million/year.

As observed above, the largest consumers and the most energy intensive consumers are not the preferential target markets for ESCOs. The main market is with medium-sized consumers (which may, however, be large companies). Considering electrical power, these would be mainly consumers in the tariff ranges from A4/AS to A3a (2,3-44 kV), with part of the commercial segment of low voltage consumers. They represent around 25-30% of electricity consumption and an equivalent portion of the value of sales of electrical energy – R$15-19 billion per year or US$6-7 billion per year.

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[5] For a comparison of the models see: Alan Poole & Thomas Stoner; Alternative Financing Models for Energy Efficiency Performance Contracting; report for USAID, July, 2003. Available at the website of ABESCO.

To such values the expenses of consumers with fuels and water should be added. These may increase the expenses with electrical energy by 25%. Assuming conservatively that reductions of 20-30% could be reached with investments with an average simple payback of 2½ years, the annual flow of the economies would be of the order of R$4-6 billion (US$1,5-2 billion) per year. Considering the same average term of simple payback of 2½ years, the "inventory" of potential investments would be of the order of R$ 9-13 billion. An inventory of this size would in principle support a volume of projects of R$1 billion per year or more.

Clearly, this calculation is very simplified. To start with it is a "gross" potential, all potentials are never exploited. On the other hand, it ignores the expected growth of the economy in the next years - which will increase the "inventory".

The estimate of the potential depends on the length of time for simple payback which is considered viable. The longer the admitted term, the larger the investment possible and the greater the reduction in consumption achieved. One of the main policy justifications of the Guarantee Facility is that it would allow an increase in the average simple payback time of implemented projects, which is currently much less than the 30 months assumed, and therefore increase the economies achieved by the projects.

Although this calculation is merely illustrative, it suggests that there is space for a large expansion of the annual volume of projects in relation to the current level. Partial analyses available from some market segments point in the same direction.

It is recommended that analyses be undertaken of the potential of specific market segments for energy efficiency services.[6] Although estimates of market potential are not crucial for the initial dimensioning of the Guarantee Facility, they would be useful references for the market agents.

2.4. Barriers to Implementing Projects

Several factors impede the realization of projects that are, in principle, economically viable. The ABESCO survey asked about the relative importance of factors that impede the implementation of proposals made to clients. Table 2.2. shows the average order of importance (ranking) attributed by the ESCOs that answered.

Table 2.2.: Main Barriers to the Realization of Projects

Difficulty	Ranking
Difficulties in financing, elevated interest rates	**1**
The client believes that he can carry out the service alone	**2**
Client's management gives low priority to improvements in the area of energy efficiency	**3**
The decision making process of the client is complex	**3**
People responsible for O&M feel threatened by the service provider	**5**
Weak understanding of the client about potential benefits	**6**
Low energy prices	**6**
In general, service providers have low credibility	**8**

[6] General studies of the potential to increase the efficiency of the end use of electricity are being prepared by Eletrobrás with resources of the GEF. The information will be very useful to estimate potential efficiency gains in various economic sectors of consumption, end uses and technologies. However, it will be necessary to consider additional factors which may effect the technical-economic potential and to increase the scope of the analyses to include efficiency in the use of fuels and water.

The most important barrier is financing – a result which confirms the general perception in the sector. At the same time, it is useful to highlight that several other difficulties in the marketing of projects are important. Selling the idea of energy efficiency services to the client is in itself a great challenge, independent of access to financing. However, the increased availability of financing should facilitate other aspects of the sale of projects.

In relation to the difficulties faced in raising financing, Table 2.3 shows the ranking of importance attributed by the ESCOs and the average index of importance attributed.

Table 2.3. : Main Difficulties for Project Financing

Difficulty	Ranking	Index off importance
Required guarantees	**1**	4,25
Interest rates	**2**	4,00
Term and grace period of available products	**3**	2,92
High transaction costs relative to the size of the project	**3**	2,92
Necessary time for the processing of the request for financing	**5**	2,67
Unfavorable tax implications when compared to financing directly by client	**6**	2,00

The guarantees required are seen as the greatest barrier, followed by high interest rates. The other difficulties are much less significant. The importance attributed to the question of guarantees corroborates the argument that a GF would be relevant for support to the sector.

2.5. Risks of Energy Efficiency Projects

We briefly consider the risks of energy efficiency (EE) projects from the point of view of the ESCOs, of the financial agents - including a possible Guarantee Facility – and the clients. When implementing a GF it will be crucial to deepen the analysis of the risks of different types of projects and measures to diminish them.

2.5.1. Risks for the ESCOs

There are risks in all stages of the development, negotiation, implementation and operation of energy efficiency projects. For the ESCOs, the development and negotiation phases are generally the phases with the greatest risks. As has been observed, the marketing of energy efficiency services is a challenge. Generally the potential client gives low priority to the subject and has a poor understanding of the potential benefits. Many times the people responsible for O&M feel threatened by the service provider and seek to impede its being contracted.

To attract the client, the ESCO needs to identify concrete measures and estimate, with increasing precision over time, their costs and benefits to the client. There is a risk that the client will desist, for several reasons, after the ESCO has already invested significant resources into the project. The risk is greater if the ESCO does not have a financing structure available.

- Many clients think that, with a basic proposal in hand, they can execute the project themselves.

- Others desist because they do not want to use their own resources and the ESCO has no means of financing.
- Other clients take a long time to make decisions or opt for a minimum investment alternative.

A GF can be seen as an instrument which would help reduce the risks and the costs of the ESCOs in the initial phases of the projects; as an indirect result of its role as guarantor of the credit. The access to financing with clear criteria would allow the ESCOs to change their approach to the client and very probably would reduce the risk of losing investments in the development of proposals that will not be implemented. The gains for the ESCOs could be significant – an additional "indirect" benefit of an effective GF.

In the implementation phase of the project the main risks concern technical flaws in the design or equipment installation which may hinder the technical performance of the project or increase its cost. Non-technical factors may also increase the project cost beyond forecasts, such as, for example, a sudden devaluation of the Real. The capacity to manage such risks is one of the basic areas of expertise expected from an ESCO.

With the commissioning of new equipment, the project enters a new phase. If the commissioning validates the forecasted performance, the technical risk will be dramatically reduced – how much depends on the type of project and on the contract. From that moment on the main preoccupation is the capacity and willingness of the client to pay. The research of ABESCO suggests that until now the rate of default of clients of ESCOs has been very low, including when compared with the rates of default on loans to companies by commercial banks.

Some types of project will have a distinct risk profile compared to others. For example, co-generation will have risks that are different from projects which only reduce the final consumption of electricity, such as uncertainties concerning the price of fuel, the price of backup power, etc. Different types of contracts also have different risks, as has been observed.

2.5.2. Risks for financial agents

For financial agents, the risks of the operation with an EE project concentrate on the capacity and willingness of the ESCO's client to pay the assumed obligations. This affirmation is independent of the financing option, be it through the ESCO, the client or a SPE. In all cases the ESCO client is the financial basis of the project. However, there are important differences between these options for the evaluation of the risks.

In all three financing options, the ESCO assumes, in principle, the technical risk of the project, including achieving the gains specified in the contract with the client. The technological risk is usually low, ESCOs use commercial technologies. However, in case the ESCO does not fulfill the contracted goals, the consequences for the financial agent may be distinct.

- In Option **A** (financing through client): the client contracted the loan and will feel the need to pay the debt to maintain its good name. The problem of the payment to the ESCO would be treated separately.
- In Option **B** (financing through the ESCO): in this case, the unsatisfied client may simply not pay the total to the ESCO, which may put the GF at immediate risk.
- In Option **C** (financing though SPE): the unsatisfied client may simply not pay the total to the SPC, which may put the GF at immediate risk.

At first sight, the exposure of the bank and the GF to the technical risks of the project is greater in options **B** and **C**. However, it is possible to mitigate this risk. For the GF it is fundamental to differentiate the ESCO from the project. The guarantee is for the project. In an extreme case, it is possible that the ESCO goes bankrupt, however the project may be transferred to another ESCO.

It is very likely that the preferred approach of the majority of the clients will be Option **B**, where the ESCO itself will take the guaranteed loan (or leasing).[7] In this case the GF would be the "oxygen" of the business and it is expected that the ESCO will seek to minimize calls for execution of the guarantee, including by compensating for clients who are in arrears. In the proposed GF project there will be incentives for the ESCOs to minimize such calls.

2.5.3. Risks for clients

The first risk faced by the energy consumer considering contracting services to rationalize its energy use is to properly select its strategy and the ESCO to implement it. In the negotiation of the contracts it is necessary to remain alert to several aspects of the relationship with the ESCO, in order to avoid difficulties in the execution of the project. In the evaluation of the projects it will be necessary that the GF also remains alert to the "quality" of the contract in this sense.

However, with a well drawn up performance contract, the majority of the risks for the client are minimal. If the targeted gains are not achieved, payments should be smaller.

There is a risk that the consumer generally will have to assume – the prices of energy vectors. However, the consumer is also usually the right agent to assume this risk since it has an automatic hedge. If the price of energy rises more than expected, the project becomes more profitable. If the price rises less than expected, or decreases, the client will have a windfall profit for all the consumption of the company which will probably be larger than the reduction in the economic gains of the project. There is a category of projects to which this rule may, partly, not apply – co-generation projects.

[7] This preference was observed in Brazil, as well as in China and India according to: Pierre Langlois; *Workshop on ESCOs and Equity Financing – Beijing, April 13-15.Workshop Summary*.

3. Introduction to the Guarantee Facility

Lack of financing is perhaps the greatest barrier to the growth of the ESCO sector in Brazil. The low implementation and dissemination of energy efficiency projects in its turn reduces the appeal to consumers as well as to banks and investors. There is a kind of a vicious cycle. In principle, the creation of a mechanism to grant guarantees for the financing of projects (via loans or leasing) may break this vicious cycle.

A Guarantee Facility (GF) is not the only important new instrument or financial product for the growth of the ESCO sector and not all barriers are strictly financial. However a GF seems to be the measure with the greatest catalyzing potential in the market. With a GF, not only the access to credit in the medium-term is achieved, but also more adequate conditions are created for the attracting risk capital. This new capital would in turn increase the financing capacity of the companies in the sector. Amongst the ESCOs, the creation of a GF has been seen as a high priority ever since the formation of ABESCO in 1997.

In this chapter we will summarize some general points concerning the concept of GF and its application for EE projects. We also consider the experience until now with guarantee facilities in Brazil and abroad – being that the international cases are examples of guarantee mechanisms specifically for energy efficiency projects. It thus serves as background for the subsequent discussion of the design of a GF for energy efficiency projects.

3.1. General Remarks

A Guarantee Facility is a mechanism for the granting of guarantees (complementary or integral) which are necessary to obtain credit for financing of investments by companies. The guarantee is granted for a specified part of the financing. It represents a commitment by the GF that, in case the borrowing company defaults, the facility will assume the payments to the financial institution of that part of the credit which has been guaranteed and will become the new creditor.

The Guarantee Facility is remunerated by a commission fee charged against the value guaranteed. The commission is collected by the financial institutions conceding the loans and is transferred to the manager of the GF. The amounts to be charged as commission vary according to each Guarantee Facility.

Guarantee facilities are administered by managers, who are responsible for all movements of financial resources, especially, the evaluation for the granting of the guarantee; the fulfillment of payment of debts guaranteed by the facility in the case of default by the borrowers; receipt of credits recovered from the defaulting borrowers and receipt of the guarantee commissions. To carry out the administration of guarantee facilities, the managers are usually remunerated by an administration fee.

In Brazil, guarantee facilities are operated, in the majority of cases, directly by the financial institutions which guarantee the operations.

The reserve capital for guarantee facilities may be composed of private or public resources and the GF can be structured in several manners. They may or not have an independent legal status. In the latter case – more common in Brazil – the funds have a strictly accounting nature.

Therefore, there are no general norms regarding formation and operation which applicable to all guarantee facilities. Each one of them possesses its own rules regarding incorporation, operation and termination, which will vary in accordance with the interests of the establishing institution and the objectives of the facility.

In order for the guarantee of a GF to be accepted by the financial institutions conceding credit it is essential that its ability to fulfill the granted guarantees have credibility. This will depend upon the evaluation of the financial institutions in relation to the following points:

- The ratio between the capital reserves (net assets) of the GF and the commitments assumed – known as the leverage of the fund.
- The perception of risks of this market and the ability of the manager do administrate them.
- The capacity of the holders of the capital reserve of the GF to increase coverage, in case there is an unexpected or emergency scenario.

The credibility of the granted guarantees is only the first requirement for the success of a GF. Issues on the design and operation of the GF are also important – such as for example the conditions for the execution of the guarantee. In Brazil, at least, the operational procedures have created difficulties which have limited the desired impacts of the guarantee facilities already created.

At the same time, it is important to take into account the perspectives of the borrowers of the loans covered by the guarantees – the ESCOs and their clients. The limits (term, value, etc) should be compatible with market reality. The cost of obtaining the guarantee – commissions and transaction costs – also must not burden the project too much.

3.1.1. Initial capital and the GF as an instrument of support

A Guarantee Facility would be a big factor stimulating the growth of the market for energy efficiency projects. Considering the benefits of energy efficiency, especially the "positive externalities" mentioned above (see chapter **2**), it is legitimate to consider public sources of resources for constituting the initial capital of the facility. It has the attraction of being able to mobilize private resources for public objectives with a minimum commitment of public resources.

In fact, there is probably no alternative. It is very hard to imagine a private financial institution capitalizing a GF for this market. One of the assumptions made here is that the GF would be an agent supporting the development of energy efficiency services sector. If we accept this premise, the commission fee for the guarantee will only be that necessary to assure the capital reserve of the GF and hence the credibility of the guarantee. Thus the objective of the GF is not to seek the best returns on capital, but to charge the lowest possible commission fee. Besides, there is no trustworthy historical basis to evaluate the risks in this sector. Considering the uncertainties and risks, the return on the initial capital would have to be increased – which would raise the cost of the guarantee substantially. The reasons for capitalizing the fund with public resources are similar to those for the creation of the GF.

With the creation of a GF an ample learning process would be initiated for: (a) diverse financial agents in the evaluation of projects and companies; (b) the ESCOs in the preparation of projects for financing. In time, a history of performance and risk would be accumulated. This would facilitate the evaluation of projects for an increasing number of agents.

In principle, the GF should gradually create conditions which would permit obtaining loans without this kind of guarantee – an evolution already experienced in at least one country (see the case of Hungary). The GF, therefore, is generally seen as an instrument for a transition to a new market for financing EE projects. The time necessary for this market transition is unknown – would it be 5 years or 15? However, when creating a GF a term should be determined for its termination. In the simulations in this report a lifetime of ten years was assumed for illustrative purposes.

It is possible that a market for this type of guarantee would continue to exist – especially if the preferred option for financing is through the ESCO. In this case, nothing impedes the extension of the term of the GF or the creation of a new facility. With the accumulated experience it could possibly be viable to attract private resources for its capitalization.

Under the general label of "public resources" there are several sources in Brazil with distinct requirements for the capitalization of a GF. If it comes from the budget of the Federal Government, a Law approved by Congress is required. This is how two GFs were created. However, the capitalization by a development bank may be determined by the bank itself without congressional legislation.

Potential international sources also exist (IFC, IBRD), each one of them with its characteristics. We emphasize here the domestic sources because the estimated value for the initial capital is quite small and the time needed to negotiate with international investors tends to be prolonged. In any case, the negotiations with international agents would probably be made easier by the existence of a previously established GF with national capital.

3.2. Brazilian Experience

There have been several experiences with guarantee facilities in Brazil, created with resources from pubic as well as private entities. Three of the most disclosed cases are official GFs: the FGPC (initials in Portuguese for Guarantee Fund for the Promotion of Competitiveness), FUNPROGER (Guarantee Facility of Proger) and FAMPE (initials in Portuguese for Guarantee Facility for Micro and Small Companies).[8]

FGPC – Fund created with the resources of the National Treasury, managed by BNDES. It has as its aim guaranteeing part of the credit risk of the financial institutions in the operations of micro, small and medium-sized companies with the lines of credit of BNDES. The emphasis of the program is to increase the competitiveness of these companies, especially for exports. An initial capital of up to R$25 million (>US$ 20 million when created) was authorized. It guarantees up to 80% of the principal of the loan. The commission fee is 0.15% of the principal per month during the term of the contract. The commission is capitalized in the loan.

FUNPROGER – A fund managed by Banco do Brasil under the orientation of CODEFAT (initials in Portuguese for Deliberative Council of the Fund for Aid to Workers) linked to the

[8] The texts of the Law creating the FGPC (Law N°. 9.531/1997) and the Law for the creation of the FUNPROGER (Law N°. 9.872/1999) are available in the Portuguese version of the report - Annexes B and C, respectively.

Ministry of Labor and Employment. It has as its aim guaranteeing part of the credit risk of the financial institutions for operations with micro, small and medium companies in the range of the PROGER (initials in Portuguese for Program for the Generation of Work and Income). The focus of the program is the low income population. An initial capital of up to R$50 million (>US$ 25 million when created) was authorized, with the possibility of doubling to R$100 million. It guarantees up to 80% of the principal of the loan. The commission fee is of 0.10% of the principal per month during the term of the contract. The commission is capitalized in the loan.

FAMPE – A fund managed by SEBRAE (an agency to develop small business). It is used to guarantee the risk of loans to micro and small companies. It guarantees up to 80% of the amount of the granted credit. The maximum limit of the guarantee is R$72,000 (~US$ 30,000). The commission fee is of 1% of the principal per year during the term of the contract. The maximum limit of the spread of the financial institution over the guaranteed credits is of 8% above TJLP, double the limit of the FGPC.

There are maximum limits to the guarantees offered by the guarantee facilities, so as to assured that all amounts due because of defaults can be paid. In the case of FUNPROGER, for example, the maximum amount to be guaranteed is limited to 11 times the amount of the capital of the Fund. In the case of FGPC, the limit is eight times.

It must be emphasized that the guarantee against credit risk granted to the financial institutions is not total. The law that created FUNPROGER, as that which created FGPC, set forth, expressly, that the financial institution will take part in the risk of the loans for which the guarantee has been given.

In addition, in the case of FUNPROGER, for example, there is a maximum limit for the default rate per financial institution, to be established by the manager of the fund. The manager may not exceed this limit of obligations. The manager will also verify the performance of the bank in its operations, with respect to: the levels of default, delays in sending required information and other aspects.

In the FGPC and FUNPROFER, it was also determined that the banks require personal guarantees of the controlling partner(s) and/or real guarantees to the amount of the credit from the borrowers. The judicial costs of the recuperation of the credit in arrears are also an expense of the financial institution.

In general, the official funds ended up not having the success imagined when they were created. Various aspects of their design have reduced their impact. Among them are the partial limit of the guarantee coverage (never exceeding 80%) and the complementary guarantees demanded. These restrictions have reduced the attractiveness of the guarantee for the potential borrowers.

At the same time, there are serious residual risks for the financial agents with respect to the liquidation of the operation in arrears. We have considered the case of the FGPC, likely to be the most relevant official fund for this study (see Box). FUNPROGER is very similar.

Problems with the Execution of the Guarantee in the FGPC

Whenever the borrower defaults and fails to pay the intermediary bank, it is the latter which becomes responsible for paying the unpaid portion to the BNDES. In order to recover the amount in arrears guaranteed by the FGPC, the bank must execute the guarantees by officially protesting the credit and for such there is a limit of up to one year from the first delay in payment.

Thus, if the bank does not wish to enter into litigation with its client immediately after the delay, for purposes of relationship, it will have up to one year to do so. While waiting for the client to clear its debits during this period, the bank must pay to the BNDES the portions not paid by the client. Judicially protesting the credit may often not be considered a satisfactory approach commercially speaking, as it affects the good name of the client, placing it in lists of protection of credit in a manner that will hinder any other operation attempted by the client in the market.

In addition, the operation of executing the guarantees is a function of their quality. That means, if the initial credit contract has real guarantees, the bank must take the assets provided as guarantee and place them in auction and then recuperate a part of the lost amount. If the guarantee is simply a Promissory Note in the name of the managers of the borrower, enforcement becomes even more complicated, as a verification of the assets in the names of these people will be necessary, for subsequent blocking and apprehension with judicial consent.

Therefore, it is a common practice in the financial market to attempt some direct negotiations with the client before attempting judicial enforcement, in order to try to obtain what is owed. From the moment when the guarantee is executed, the FGPC becomes responsible for honoring the intermediary bank's operations with the BNDES and liquidates the defaults transferred by the bank (limited to the defaults of the last 12 months).

3.2.1. The experience with existing guarantee facilities in Brazil

The existing official guarantee facilities have generic deficiencies which have diminished their impact on the access to credit of the market segments supposedly being benefited.

The possibility of using existing GFs to guarantee projects of the ESCOs has been taken into account, not only technically but also in practice. Notwithstanding attempts made by ESCOs, no projects have received a guarantee. The general difficulties of the official GFs summarized above are amplified by the specific conditions of this market. We therefore propose a GF specialized in energy efficiency projects with ESCOs.

The existing official Guarantee Facilities are not adequate models and do not meet the needs of the energy efficiency sector. The GF proposed in this paper is a much more specialized facility than the existing official GFs. In all of them the target companies are micro to medium in size. Inside this universe there are different emphases, however with a low level of specialization – one emphasizes exports, another emphasizes employment, another emphasizes very small companies. They seek to increase access to credit for thousands of small and medium companies in almost all economic segments of the country.

The existing GFs are merely "accounting entities", and do not have a separate legal status. They are managed by the banks that originate the credit and their only relationship is with the banks (financial institutions) that transfer the credit.

Different from the existing GFs, the Manager of the Guarantee Facility for energy efficiency will be acquainted with a restricted number of key agents (the ESCOs), the sectors in which they operate and the operation of energy efficiency projects. Investments will be clearly defined for the clients who sign the contract with the ESCO. The ESCO will assume the technical risk of the project.

In the existing funds the Manager is restricted to the analysis of performance (including rates of default) only of the banks granting the credit. In the proposed GF, the Manager will mainly accompany the performance of the ESCOs implementing guaranteed projects. As an example of this new approach, in the following chapters we will defend the thesis that the commission fee should partly depend on the risk history of the ESCO with the GF, instead of a fixed commission fee, as in the existing GFs.

The operation of a specialized GF as proposed in this report will require intense involvement of the Manager in the operations for the projects, which is very different to what takes place with the existing facilities. The management of a GF by a bank issuing the ultimate credit (e.g. BNDES) probably is therefore probably not the most adequate solution – due to the work volume, the operational flexibility needed and specialized know how required in the operations of energy efficiency. In this case, it would be necessary to define a legal entity (not only accounting) and the means of selecting it.

3.3. International Experience

We summarize below information concerning guarantee facilities for energy efficiency projects in two countries – Hungary and China. The two examples are very different and show a diversity of the possible approaches.

3.3.1. Hungary

The country is considered one of the most successful in central Europe in terms of the consolidation of an ESCO industry. The existence of a pioneer GF is considered to be a key element in this success.

The GF, named HEECP (*Hungarian Energy Efficiency co-Financing Program*) was created in 1997 by IFC (International Finance Corporation) with US$5 million in resources of the GEF (Global Environment Facility). Conceived as a pilot program, it had a term until 2001. It was considered a success and expanded with HEECP-2 for the years 2001-5.[9]

Out of the total of US$ 5 million, US$ 4.25 million (85%) were allocated for guarantees. The remaining served as subsidy for transnational costs

- US$ 300 thousand for technical support, mainly for financial institutions (IF) to cover evaluation costs etc.
- US$ 450 thousand for operation and administration

The IFC executed bilateral agreements, called Guarantee Facility Agreements (GFA) one by one with the main Hungarian commercial banks. The GFA sets forth a ceiling for the total

[9] Diana Ürge-Vorsatz, Pierre Langlois, Silvia Rezessy; *Why Hungary? Lessons learned from the success of the Hungarian ESCO industry*.

guarantee, called FLL (Facility Liability Limit). For this the bank pays a guarantee commission of 1% to the IFC.

In the "Hungarian model**"**, there is not an entity in the country which may be called a GF. Each bank simply incorporates the general guarantee limit in the GFA of the IFC within an existing product and adjusts its evaluation process for the presented projects, or creates a new product, and sells more aggressively to segments with more explicit EE.

The bank itself requests, analyzes and approves the projects and makes the decision on the limit of leverage of FLL.

The guarantee is partial, up to 50% in general. Therefore the banks (or its leasing branch) demand additional guarantees such as:

- Right of access to the bank account in which the liquidation of the energy efficiency operation is made between the ESCO and the client.
- Alienation of the equipment to be used in the operation of energy efficiency.
- Benefficiary of the equipment insurance is the financial institution
- Deposit of a guarantee of 10% of the operation

At the same time the requirements are less than they would be without the guarantee and there is increasing emphasis on the quality of the project receivables.

Two modalities were defined: "project by project" and also "portfolio" where a reserve is created jointly with the IFC.

The first example of a "portfolio guarantee" was in the residential sector (mainly central heating) – with 2050 projects. Carried out with leasing and a principal of US$ 1.5 million. HCEEP put 11% into a reserve fund and the Hungarian commercial bank (Reifeisen) put 4%. There is no guarantee obligation above 15% of the portfolio (or $225 thousand). Coverage is 100% of the principal (but does not cover accrued interest). The bank also pays a 1% commission to IFC.

Despite being considered a success, the mobilization of HEECP was relatively slow. In 2000 – after over two years of operation – only six projects were guaranteed, to the amount of US$ 2.7 million (with guarantees for 50%). The projects were implemented by three ESCOs.

Besides the six projects there was a portfolio described above. Three banks signed GFAs, but there were great differences in the effort of the banks – at least in this initial phase.[10]

For the time being we don't have more updated information concerning the guarantee operations – however the number has grown substantially. Some characteristics of the projects in the first phase:

- Size: from US$ 37 thousand to $1.5 million. The minimum size is surprisingly small. The projects in the "portfolio" were even smaller.
- Term from 3 to 7.5 years. Five years being the most common
- All projects up to then were structured as leasing.

In this phase there was very little impact on the type of project in terms of diversification.

[10] CJ Aron Associates, Inc; *Hungary Energy Efficiency Co-Financing Program – Mid-Term Evaluation*; Report to IFC and GEF; October 2000.

3.3.2. China

China's experience with a GF created to support the expansion of the ESCOs (called EMCs) began more recently.[11] GEF (Global Environment Facility) funding of US$22 million was designated to support the creation of the EMC Loan Guarantee Program Special Fund. In late-2003, an initial tranche of US$11 million was liberated, against which loan guarantee commitments are now being made. The plan is to disburse the remaining balance via two US$5.5 million tranches over time as the total outstanding guarantees begins to approach the level permitted by the capital reserve, which is expected in years two and three of the project. The China National Investment and Guaranty Co. (I&G) was chosen as the agency to implement and administer the initial tranche. I&G is China's largest, and only national-scale, guarantee company.

The loan guarantee fund has been established to run for a period of seven years. The objective of the program is to catalyze a high level of EMC project investment over the long term. To help achieve this, the guarantee fund is expected to leverage its capital resources as much as possible. It is hoped that the domestic bank sector will consider the capital reserve of the fund to be suitably liquid and credible so that the fund can support a guarantee commitment that is 3-5 times the value of the capital reserve at any point in time.

The program is intended to engage and strengthen the participation of domestic banks as much as possible, so that they become increasingly familiar and comfortable with lending to the EMC industry, and ultimately become willing to undertake EMC credit risks themselves.

The Fund is intended to provide partial credit guarantees of up to 80-90% of the loan principal initially, with declining shares over time. Guarantee periods are expected to range between 1-3 years, and individual operations are expected to be relatively small. Hence, guarantee commitments will "revolve" fairly quickly. The most important leveraging factor for the Fund is this revolving nature of the guarantees.

The goal is to have catalyzed US$380 million of investments by the end of 2009. By the end of the first quarter of 2005, after 15 months of operation, I&G had approved guarantees for 43 projects with 18 EMCs, totaling RMB 98 million or about US$12 million. Since only 75% of the value of the loan is covered, the total of the loans was 118 million RMB (US$15 million).

A key point of discussion among various industry stakeholders has been in regard to the counter-guarantee requirements that I&G places upon new EMCs applying for loan guarantees. These requirements are often as strict as those of commercial banks. The risk of overly restrictive counter-guarantee requirements is that they could undermine the rational of the EMC loan guarantee program in the first place. This is especially so in the EMC sector where many new companies do not possess sufficient balance sheet strength to support onerous counter-guarantee requirements. A key point of consensus, however, is that I&G should not necessarily need to take on additional risk in order to provide an increased volume of loan guarantee approvals. The clearest way to meet this objective of greater volume without increased risk is for I&G to look not merely at the balance sheet collateral of applicant EMCs in consideration of guarantee approvals, but rather to begin to apply more innovative financing methods.

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[11] Summarized from: (**1**) Daniel I. Blanchard; *Progress Report on the Loan Guarantee Component of the World Bank / GEF Phase II China Energy Conservation Project*; Report to the World Bank, March, 2005. (**2**) Presentation by Zeng Shangyou about "EMCo Loan Guarantee Program" on the Meeting of the Three Countries in Beijing, April, 13-15, 2005.

There is an expectation that the requirements will gradually become less stringent, especially for those EMCs that have developed a track record of successful I&G backed project implementation, and that have developed a positive relationship with I&G management.

The guarantee program is complemented by training and technical assistance provided by EMCA (the Chinese ESCO association) and I&G, which helps to raise the quality of new EMCs, and project proposals.

4. Issues in Design and Functioning of the Guarantee Facility

4.1. Coverage of the Guarantee

In analyzing the creation of the GF a first point to be considered is the percentage of the loan for which it should offer coverage: In the first years of functioning a coverage of 100% of the principal seems to be necessary, because below this percentage the financial agents can still feel insecure in becoming exposed to credit for companies with the characteristics of ESCOs.

The 100% coverage suggested for the beginning of the functioning of the GF may be gradually reduced as the industry becomes known in the financial community and creates a positive history with creditor institutions. The idea of reducing coverage over time follows the rationale that the GF should serve as a "pump primer" for the industry, and after the market is consolidated can and should be extinguished. However, in order to simplify the simulations to be presented in the next chapter there were no alterations in the percentage of the coverage during the facility's life, that is it remains 100%.

On the other hand, there is a negative effect in conceding protection of 100% of the credit. It concerns the obligation of the lending agent to evaluate the payment conditions of the client and the guarantees provided in the operation. In other words, if the agent is aware that 100% of its risk in the operation is, for example, borne by the National Treasury or the BNDES, the agent may not be careful in the credit evaluation of the client, generating future problems for the GF which guaranteed the operation. This kind of risk is known as moral hazard and it may in fact harm the viability of the Guarantee Facility if whomever is responsible for the credit evaluation suffers no penalties in the case of default.

This risk can damage the viability of the GF, not only through the worsened quality of its credit portfolio, but also through the expectation (forecast) by some more conservative agents, that this movement may take place and that the GF may not be able to honor all guarantees granted. This fear may cause agents to cease to use the GF.

To minimize this kind of problem it is important that some precautions be taken in the design of the GF. Four initial proposals are:

1. The lending insitution will only receive the guarantee for the principal (and the capitalized portion), retaining the risk for the interest of the operation of its part (its *Del Credere*), the interest of the part of the responsible agent for the funding and the portion of TJLP exceeding 6% of capitalization. In this case, in practice, risk coverage by the GF would not be 100%.

2. The projects would be technically evaluated by entities appointed by the GF itself. Such entities, responsible for the certification of the projects, will know well the type of project in question, be independent from the ESCOs submitting the projects for evaluation and have an excellent reputation in the energy efficiency field. The importance of the good history and of the reaction in the market is due to the greater credibility conferred to the project certification.

3. The companies involved in the project (ESCOs and Off Taker) shall have their credit risk analyzed by the GF. It is important to make clear that the credit risk of the operation is not

limited to the ESCO, but also to the company hiring the energy efficiency service. The evaluation of credit risk shall consider not only the payment conditions of the parties but also the guarantees involved in the operation.

4. The names of the stakeholders of the GF should be strong enough and the idea of supporting the industry should be clear, in order to avoid some agents imagining that the stakeholders will not make capital contributions in case of necessity, leaving the GF unable to fulfill all the commitments which it may come to have, in other words, leaving the lenders without the contracted guarantee.

The first suggestion above seems at first sight to represent a significant exposure for the intermediary bank carrying out the loan with BNDES (or other development bank) resources. However, the spreads of both the intermediary bank and the source of the resources are limited and together should not exceed 5% (4% for the bank and 1% for the source) per year in the most conservative scenario (as a consequence of the % of coverage one could even consider that the limit of the spread of the bank could be lower). Considering the current TJLP (9.75%), the portion exceeding 6% - which would be capitalized according to the rules of BNDES and is therefore guaranteed by the GF - is 3.75%. Thus, in the worst case, a default of interest for a period of a year over the principal plus monetary adjustment of the principal, would not represent more than 11% of the credit. This exposure may be considered to be smaller if we observe that more than one third of this exposure (the *del credere* maximum of 4%) in reality does not represent a “loss” for the intermediary bank, but a gain that he failed to obtain.

With the information above the following rationale would be expected on the part of the intermediary bank agent: take part or not in an operation which does not use of its own capital and which can represent a gain of 4% (*del credere*) if nothing goes wrong or a possible loss of up to 7% (non-capitalized portion of the current TJLP plus the spread of the source of the resources)? The probability of this loss is equivalent to the estimated rate of default. In the simulations which will be presented in the next chapter, a conservatively high rate of default of 10% is assumed. Simplifying, the final calculation for evaluation of the operation will confront 4% vs. 0.7% to calculate the final gross result, while obviously also considering the cost of all the administrative work that the defaults generate.

The cost of the technical evaluation will remain the responsibility of the ESCO requesting the guarantee. As a means of commitment and interest in the guarantee the ESCO will initiate the process of requesting the guarantee with the technical/economic certification granted by an entity credenciated by the GF. The main justification for leaving the expense of certification with the ESCO resides in the fact that it does not unnecessarily burden the GF with projects which will not be approved due to lack of technical/economic viability. These would end up being subsidized by companies with good projects through the increase in the average guarantee commission fee, which will be set at a level sufficient to cover the full costs of the GF.

In summary, if we left the payment of the technical evaluation with the GF we would be stimulating ESCOs to send projects of doubtful quality, since they would not suffer any loss in the case of rejection. This could end up damaging the ESCOs with good projects as the guarantee commission fee would reflect these lost expenses.

There is a possible new focus of “moral hazard” at this stage of the evaluation procedure, since the ESCO would be responsible for paying the service rendered by the entity with the power do grant the necessary certification to obtain the guarantee. However, since the entity that will perform the evaluation will be credenciated by the GF and should (as recommended) have a

good reputation to protect knowing that the projects' results will be accompanied, we believe that this hazard will be minimal.

4.2. Type of Project Covered

Should the GF have restrictions in relation to the type of project eligible to obtain the guarantee? Several restrictions are possible at first, such as:

1. Size and/or term of the project;
2. Share of energy efficiency measures in the investments and/or results of the project;
3. Market segment or technologies;
4. Type of contract;

Below are some preliminary comments concerning issues which we consider relevant:

1. Size and/or term of the **project** – In principle there should be no limits on the minimum size and term of the projects. However, to avoid possible losses in very small or short operations there should be a minimum total commission to be paid per project.

In relation to the maximum size of the projects, the limit should be a function of the total exposure of the GF. We estimate that 5% would be an adequate percentage of the total exposure.

2. Minimum participation of energy efficiency measures – Projects with energy efficiency measures frequently add other measures to optimize the use of energy or other inputs (for example, compensation of reactive energy, improvement of the quality of the energy, reduction of water consumption). Should the GF impose a minimum limit of participation of energy efficiency measures in the investments and /or economic gains of the project?

Some space must be allowed to include measures besides energy efficiency. At the same time, we recommend a minimum of at least 50% participation of EE measures for projects to be eligible to obtain the guarantee.

3. Market segment and technologies – In terms of market segments or sub-sectors (commercial, hospitals, industrial sectors, etc) there should be no limitations. In terms of technologies, it is evident that the technologies used should be commercially proven. In any case the technical risk will clearly be borne by the ESCO.

A remaining doubt is whether co-generation projects or distributed generation should be included in the portfolio of the GF. Typically these are larger projects, with distinct risks and longer terms of financing (especially in the case of co-generation). We believe that at least co-generation shall be included – after all it is a measure of efficiency in the use of fuels. Including co-generation would substantially increase the potential market for the GF, which may influence the sizing of the initial capital.

On the other hand, distributed generation with fossil fuels without cogeneration (for example, peak hour generation) usually does not increase efficiency. If included, it should be subject to the limitation of point 2 above.

4. Type of contract – In relation to performance contracts, all three basic options summarized in chapter 2 shall be eligible. Therefore, the guarantees may be granted to the ESCO, to the client of the ESCO or to an SPE.

The majority of projects until today are implemented with standard contracts for engineering services, not as performance contracts. Should only projects with performance contracts between the ESCO and the client be eligible for the guarantee? Two observations are relevant:

a. It is crucial that the ESCO clearly assumes the technical risk of the project. The failure to pay by the client to the ESCO due to flaws in the project, is also a risk covered by the GF, as will be seen below.
b. The legal evaluation of the contracts will be a part of the approval process. A certain standardization of the service agreements of the ESCOs would be desirable, especially for performance contracts. This would simplify the evaluation process for the financial agents and technicians involved in the analysis and certification of projects. Since the performance cdontract is not a type of contract frequently used in the Brazilian market, its standardization would diminish doubts that could arise as the volume of operations expands. Standardization may also reduce the potential for misunderstandings between the ESCO and the client.

4.2.1. Issues specific to financing through the ESCOs

The option of making the loan through the ESCO would be made viable mainly by the GF. This modality is attractive for many clients, as they do not need to worry about obtaining resources for the development of the project. In view of the clear advantages it is expected that this modality would grow considerably.

One risk for the GF in this modality is that the client may not pay the ESCO because it is unsatisfied with the conduction or results of the project or for other reasons which do not have to be listed at this moment. In this case the GF must pay promptly, despite the fact that the root of the problem is not the credit (capacity of payment) of the client of the ESCO. This posture is fundamental to maintain the credibility of the GF with banks and other financial institutions. At the same time, the GF needs robust means to recuperate the losses due to failures of the ESCO in the implementation of the project, as has been observed. In terms of the relation of the ESCO with the GF, this type of default of the client is much more problematic than a default due to lack of capacity of the client to pay.

Aother side of the problem above concerns a project that is being well conducted, but the ESCO has financial problems to the point of closing down. In this case the GF needs to have the right to transfer the project to another ESCO to manage. The transfer of viable projects of the bankrupt estate of the ESCO is a usual practice in the US market. With this, the risk of the possible bankruptcy of the ESCO is minimized for the GF.

Obviously, if the ESCOs do not accept the clauses of the guarantee contract with the GF, they may not have their projects guaranteed by the GF.

4.3. Independent Evaluation Capacity of the Guarantee Facility

As suggested above, an entity credenciated by the GF, but paid by the ESCO requesting the guarantee, would make the technical evaluation of the viability of projects and of the capacity of the ESCO in implementing the project. The professionals composing the credenciated entities should be independent of the ESCOs and their interests.

The credenciated entity will be responsible for evaluating the technical aspect of the projects (the capacity of the project to produce the results foreseen by the ESCO). On the other hand, the evaluation of the capacity of the ESCO and its client to honor their financial obligations must be carried out by the GF itself. The GF will be the company responsible for the analysis of the credit of the ESCO and its client and will also be responsible for the more bureaucratic tasks linked to the day to day functioning of the GF as will be presented below.

The entity carrying out the technical evaluation will also technically analyze the contracts signed between the GF and its clients.

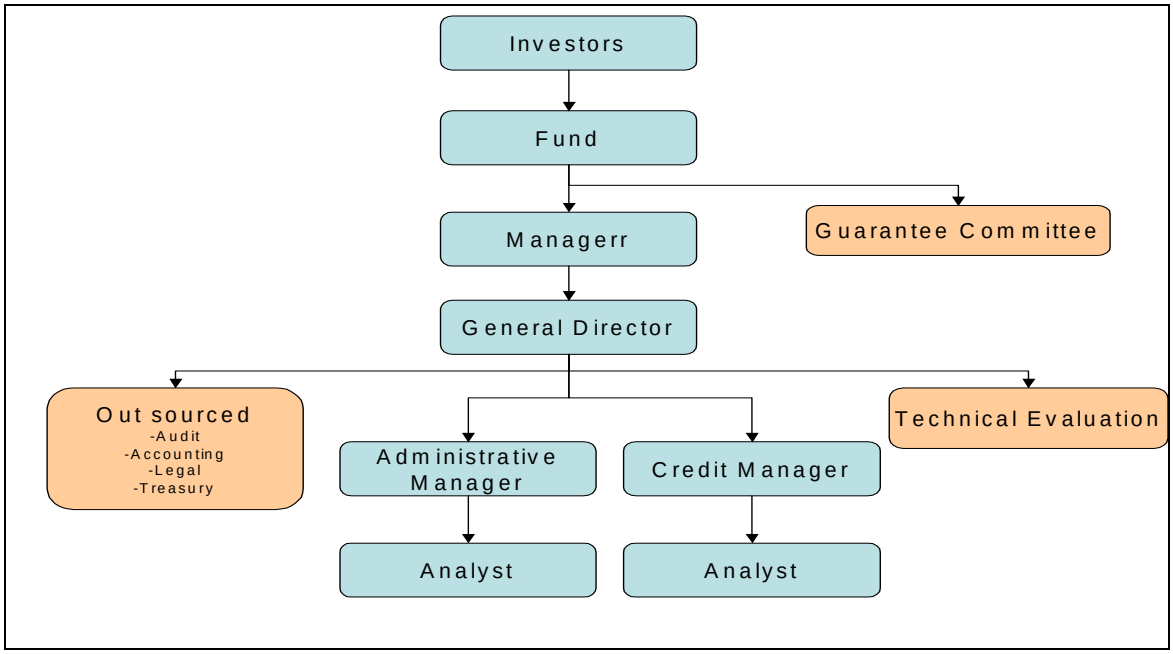
It is worth pointing out that a considerable part of the risk of the operation is linked to the performance of the contracts, and therefore a trustworthy technical review is seen as a great factor in minimizing the risk of default of the portfolio of the GF. Obviously the credit risk of the ESCO and of the contracting company cannot be ignored, and these will be well evaluated by the GF. The credit analysis should take place before the technical evaluation of the project, in order to reduce the risk of the ESCO losing the cost of the technical evaluation.

This stage, despite being somewhat expensive for the ESCOs and requiring additional time for the granting of the guarantee, is of fundamental importance for the viability of the GF, and, therefore for its stakeholders, as it represents assurance regarding the quality of the portfolio of the GF.

Soon after a positive evaluation is received from both the certifying entity and those responsible for the evaluation of the credit, the project will be forwarded to the Guarantee Committee. The Guarantee Committee would be composed of the investors and the manager of the GF and will decide about the concession of the guarantee.

4.4. Cost of Management and Evaluation of the Fund

The proposed Guarantee Facility would have the structure shown in the diagram below:



Investors would capitalize the Guarantee Facility, created according to Brazilian law. The Facility would choose a manager, who would be responsible for the management of the Facility. The Managing Entity (Manager) will have a General Director who will be the legal representative of the Manager, together with the investors, in the Guarantee Committee. Besides the General Director, the Manager would have 2 managers, one responsible for credit evaluation, the other for the remaining activities. Two analysts would aid the managers. Activities susceptible to outsourcing which do not form part of the essence of the business - such as auditing, accounting, tax advice, legal, treasury, etc - would be outsourced,

The proposed structure shall have a monthly cost of about R$ 80.000 (~US$33,000), as shown below:

Monthly Costs:		
Personnel:	General Director:	R$ 12.000
	Administrative Manager:	R$ 6.000
	Credit Manager:	R$ 6.000
	Analyst:	R$ 2.500
	Analyst:	R$ 2.500
	Subtotal:	R$ 29.000
	Social Contributions:	R$ 29.000
	Personnel Total:	R$ 58.000
Administrative Expense:		R$ 10.000
Outsourced:		R$ 12.000
Total:		**R$ 80.000**

As has been mentioned, the GF will contract a company to carry out operations such as: analysis of credit risk of the operations; reception of proposals and conduction of the necessary documents for the evaluation of the associated risks; preparation of guarantee contracts, calculation/collection of the commission fees, communications to applicants, etc (taking care basically of the bureaucratic issues and playing the role of a back office for the GF, besides the risk evaluations inherent to the business). These expenses are included in the item "Administrative Expense" in the table above.

Besides the structure already described, the GF will also need to hire an institution as financial administrator of the GF. The administrator will be responsible for the management of cash (purchase and sale of public titles in function of the payments/receipts of the day) and for the preparation of the accounting statements. The functions of the financial administrator should not represent a significant cost.

It is a simple and slim structure with the technical evaluation carried out externally by entities accredited by the GF. In any case, in order to have a quality portfolio and assure the long-term viability of the GF, it is important that all these functions be carried out well.

4.5. Execution of the Guarantee

It is very important that the GF have a simple and non-bureaucratic relationship with the intermediary banks that concedes the guaranteed loans. The idealized simplicity does not mean that any operation will be approved and will have the guarantee of the GF immediately, but only that the procedures for execution of the guarantee, in case of default, to the lender will be carried out in a non-bureaucratic manner and as quickly as possible.

To make the GF an instrument that is not only safe for the beneficiary agent, but also simple to be used in case of necessity is important to make the credit viable to small and medium companies. The execution of the guarantee shall be made immediately after the request of the creditor bank has been received. From this moment, any other request for a guarantee by the defaulting company will be denied until the situation is rectified.

The ESCO should have strong incentives to avoid as much as possible situations where the GF must honor default obligations, be it through discounts in commissions for perfect fulfillment of project payment obligations or as penalties for poor performers, including impeding new guarantee contracts after a certain period of delay in payments.

4.5.1. Role of the Banks in the Execution of Guarantees

So as not to leave the intermediary banks completely disencumbered of any obligations in the operation, they will be responsible for collecting from the borrower the portion of the credit not covered by the guarantee. After all, the client is included in its commercial portfolio and, to obtain what is owed to it in the operation and the interest due to the agent providing the resources, the bank needs to make the borrower pay the debts due to it. The GF will only transfer to the creditor the amount of the capitalized principle of the loan, being the financial agent responsible for the portion of the TJLP which exceeds the capitalized 6% and the spread of the agent providing the original resources (usually the BNDES).

The spread of the intermediary bank would be limited as it is in the BNDES operations which utilize the FGPC. The maximum of 4% allowed for operations of the FGPC might even be reduced because of the increase of the coverage of the guarantee (100% instead of 80% of the principal). For the effect of the simulations in the next chapter, the spreads of the intermediary bank and the BNDES do not impact on the GF, since the latter only guarantees the principal of the operation.

4.6. Guarantee Commission

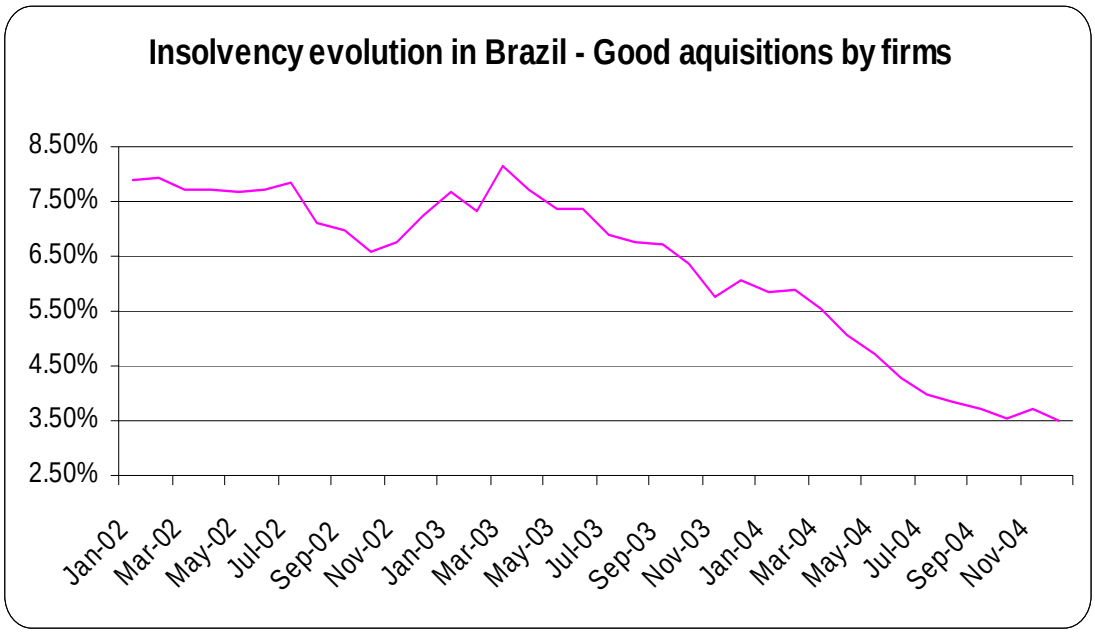
The main source of revenue for the GF will be the collection of a guarantee commission fee. For the effect of the financial simulations of the GF an average value of the commission will be used. However, there can and should be differences between operations considering especially the history of the ESCO with the GF. The commission would be collected by intermediary bank making the loan or by the original provider of the resources (e.g. BNDES). The credit released to the ESCO will come net of the guarantee commission, which shall be transferred to the GF immediately. The commission will be capitalized in the principal of the credit requested by the ESCO at this initial moment. If the ESCO requested a credit of R$1,000,000 with a commission of R$50,000, the ESCO would receive R$1.000 thousand net in its account, however it would have a liability of R$1,050,000 with the intermediary bank.

This collection procedure at the beginning of the operation seeks to guarantee that the commission of the GF is effectively paid (there is no default at this initial stage). It also allows the GF to make a financial gain, which is the interest on the resources received up front. These resources will be invested in liquid government bonds to form the backup of the guarantees. At the same time, the capitalization of the commission fee in the credit contract relieves the ESCO of a “non-operational” expense at the beginning of the project, once the commission will only be paid during the term of the financing together with the principal.

In order to avoid possible losses in projects with insufficient size and or term to pay the associated expenses of the guarantee, it is proposed that a minimum guarantee commission be collected per project – perhaps R$10 thousand.

4.7. The Default Rate and its Impacts on the Guarantee Facility

The amount to be collected as a commission fee should be calculated as a function of the “estimated” rate of default for the portfolio of the GF and the administrative costs. Attempting to estimate the volume of default in this market is an ungrateful task for the same reason which motivates the creation of a GF: the inexpressive history of relationship between the ESCOs and financial institutions. In order to try and estimate a reasonable level of default which we may expect from this industry, we take as a proxy data from the Brazilian Central Bank concerning defaults by companies in the acquisition of assets. In the graph below it can be seen that the default has been decreasing over recent years, from over 8% in 2002-03 to close to 3.5% in 2005. Adding a security factor over this data in favor of greater conservatism in the simulations, we have assumed a default rate of 10%.



It is worth remembering that peculiarities of the Shared Savings contract (the risk for the creditor is not limited to the non-performance of the ESCO, but also to the default of the client contracting the ESCO) may generate discussions concerning the estimate of the default rate.

This problem is minimized when we remember that the payment related to the project executed by the ESCO usually comes from resources which would be used to pay the energy supplier of the contracting party in case the consultancy had not been rendered. Therefore, the credit risk may be considered slightly smaller. In addition, as observed above, if the ESCO enters bankruptcy, it is perfectly possible to transfer a viable project to another ESCO, diminishing the performance risk.

One of the objectives of the simulations of the operation of the GF, which will be presented below, is exactly to estimate a guarantee commission which makes the functioning of the GF viable without over-burdening the operations of the ESCOs as a result of the projected rates of default. In the simulations, different rates of default are used to propose a range of commission fees for the secure functioning of the GF.

4.8. Leverage of the Capital of the Guarantee Facility

Last, though not less important than the other points mentioned above, there is the question of the level of leverage with which the GF can or hould operate. The leverage is directly related to the benefit that the GF will bring to the energy efficiency industry, since the greater the leverage, the greater will be the volume of guaranteed financing. Just as a reference, the leverage initially proposed is ten times the reserve capital. On the other hand, leverage means risk: because the greater the exposure, the greater the potential for loss due to the default of the clients with the financial agents.

The main factor in the choice of the allowable leverage will in fact be the default rate estimated for the GF. Thus, as with the guarantee commission fee, the appropriate level of leverage can only be estimated if the default of the portfolio of the GF is known. The simulations which follow will bring together some scenarios of default rates and guarantee commissions combined with different leverage levels. These are the three main factors whose sensitivity must be carefully analyzed during the simulation exercises, because they are fundamental for the success of the GF, be it in terms of viability for the investors or be it of the commercial interest of the clients of the energy efficiency industry.

4.9. Sizing of the GF and the Initial Capital

A basic decision is fixing the amount of the initial capital of the GF which will be applied by the investors. The value of the initial capital in its turn determines the maximum volume of guaranteed credits per year, depending on the rate of leverage chosen.

For the initial simulations we have sized a GF capable of attending to the entire current ESCO market – very approximately R$80 million (US$ 30-35 million) per year. Assuming that loans cover 80% of the investment, that there is 100% coverage of the principal by the guarantee and there is a leverage of 10, the initial capital required would be about R$6.5 million (US$2.7 million)).[12]

We recognize that this sizing of the capacity of the GF is somewhat arbitrary.

- As has been emphasized in sub-chapter 2.3, the estimates of the existing ESCO market are very uncertain and based on fragmented information.
- It is very unlikely that all projects of the ESCOs would be guaranteed (to start with, many today are probably too small to justify the technical certification and other transaction costs).
- On the other hand, the ESCOs believe that a successful GF would have a very positive impact on the volume of business, significantly expanding the market.
- Unfortunately, there are no systematic analyses of the potential market for ESCOs to guide estimates of the impact of access to financing.

For the purposes of simulating the viability of the GF, the size of the initial capital is not essential, since the proportions are maintained whatever the capital initially invested. In this way, if the initial capital were R$10M the relations between the variables which will be presented below would remain proportional (if that were assumed for the only expense item calculated in a fixed manner, “Administrative Expenses” of R$80,000 per month).

The initial capitalization assumed in the simulations is much smaller than the initial capital allocated to the existing official GFs. The FGPC for example had a capitalization of R$25 million (>US$20 million) in 1997 (see sub-chapter **3.2**.). If the market experience is positive and there is a great demand for guarantees, the initial capital proposed could be increased or another GF might be created.

[12] The calculation to reach R$6.5M of capital was the following: R$80M of estimated volume of business x 80% of the funding x 100% of coverage divided by 10 for leverage -> (80M x 0,80 x 1) / 10 = R$6.4 -> which was rounded to R$6.5M.

5. Guarantee Facility Simulations

5*.1 Parameters for the initial simulation of the GF*

With the objective of better evaluating the effect of the introduction of a Guarantee Facility on the energy efficiency industry, a simulation was carried out involving the most important aspects of the realities of the entities involved. For this purpose, various premises had to be estimated relating to the functioning of the GF and of the other agents involved, as well as to9 the main macroeconomic variables estimated.

It should be emphasized that the simulation seeks to set a realistic context that is somewhat pessimistic in the evaluation of the viability of the GF, considering a baseline scenario that is more negative than the current reality would suggest. The initial premises are:

a) Financing: The credits granted to the ESCOs will have average terms of 36 months with a grace period of 12 months. The interest rate will be based on the TJLP plus the spreads of the agents. The TJLP is currently at 9.75% per year. However to try to make the simulation more realistic this rate will decline by 0.5% per semester until it reaches a limit of 6% per year. The spreads of the agents will be 1% for the source of the resources and 4% for the intermediary bank.

b) Default Rate: The default rate will serve as the basis for the projections of the monthly disbursements that the GF will have to make in order to honor the guarantee (irregardless of the origin of the problem which led the borrower to default). To subject the evaluation to a pessimistic condition, a default rate of 10% of monthly payments is being supposed during the entire simulation.

c) Recuperation of the credits in arrears: To simplify the model, the credits shall only be recouped once a year, always at the end of the year. The rate of recuperation of credits shall also be modified during the analysis, starting with a recuperation of 2.5%, being increased annually by 2.5% until it reaches the maximum limit of 10% per year. Obviously, the rate of recuperation (which varies between 2.5 and 10%) will be applied only to portions in default.

d) Conditions of the Guarantee: The risk assumed by the GF will be 100% of the capitalized principal. Despite the problems involved in credit operations with 100% risk of coverage (especially the moral hazard discussed in chapter 4) it is unlikely that a percentage below this would have the desired effect on the industry in the initial phase. In the simulation, there will be no delay in the receipt of the payments due to the intermediary bank, for whom it would be as if there had been no default.

   Penalties against defaulting companies are not being considered in the model under analysis. However, it is recommended, as stated above, that there be penalties for the companies considered bad payers, by creating difficulties and higher fees for new attempts to access the guarantee. These penalties should contribute towards a progressive improvement of the quality of the portfolio, reducing the default rate.

e) Guarantee commission fee: The guarantee commission fee will be 0.26% per month over the guaranteed amount. It represents an average of the rates effectively collected.

As usual in the market of guarantee facilities in Brazil, this value will be paid at the moment the resources are liberated. The formula for calculation is the following:

0.26% x Term (in months) x Credit Principal

The amount of the guarantee commission will be added to the principal of the operation and will be paid at the very beginning, so that there is no possibility of failure to pay by the borrower. For the borrower the amount referring to the commission will be incorporated in the requested loan without diminishing its initial size. However it will be incorporated in the calculations of the financing guaranteed by the GF such as the ceiling for coverage and the estimated amount in default.

f) Administration fees of the GF: The administration fees of the GF will pay the firm contracted to support the functioning of the GF for tasks such as: credit analysis of the proposed projects, control and bureaucracies inherent to its functioning, such as the drawing up contracts and the day to day evaluation of the portfolio. The resources paid to the financial institution managing the cash of the GF will also enter as an administrative expense. As described in chapter 4 concerning the design of the GF, all these costs should probably not exceed R$80,000 (US$33,000) per month, considering the amount of capital initially assumed.

g) Coverage guaranteed by the GF: The facility will only guarantee the principal of the contracted loan, including the capitalized charges. Therefore, the intermediary bank will be responsible for: the value of its *del credere* (maximum of 4%), the spread of the source of the resources *(*maximum of 1%) and the TJLP not above the capitalization rate (6%).

h) Management of the assets of the facility: The cash of the facility will all be applied in federal bonds with high liquidity in the market. Thus the only credit risks that the facility would encounter concern the loans being guaranteed. The cash of the facility will be comprised by: its initial capital, the guarantee commissions received, the recuperated credits during the lifetime of the facility, and the interest received through the application of the cash - less the operational expenses and the executed guarantees. The initial return of the application will be 1.45% per month, decreasing by 0.02% monthly until reaching a minimum of 0.9% per month. All resources will automatically be reapplied during the analysis.

i) Financing cycles and guarantee: In order to simplify the functioning of the GF for the purposes of the simulation, guarantee cycles were defined. The cycles are the periods during which the guarantees are granted and those approved in each cycle will always begin together. Three cycles per year are assumed. In each cycle the leverage limit is defined. The care with respect to the leverage limit is motivated by the fact that, with financing of 36 months and approval cycles of 4 months, there will be financial operations with different cycles coexisting.

j) The limit of leverage: The maximum annual rate of leverage of the facility will be 10 times the initial capital adjusted by the interest rate of the assets. In this way, in each new cycle of approval, the available amount that can be guaranteed will be calculated as a function of the initial capital adjusted until the date in question by the interest rate of the assets, multiplied by the leverage limit (10) and divided by the number of cycles that will take place per year (in this case 3). The choice of this procedure instead of some formula taking into account the total of financing in relation to the real assets of the GF in each guarantee cycle was simply technical. In case the second option were used, the model would present circular calculations[13] since in order to calculate the new potential of granting guarantees it would be necessary to know the amount already liberated and the net assets at the same time. However, to know the net assets it would be necessary to know how much has been liberated in order to calculate the commissions already paid etc...

   We have thus opted to use an adjustment factor for the net assets so that they do not remain static at the initial value (in this case R$6.5 million) to provide a basis for calculating the new guarantee cycles. The choice of the rate of return of the assets in the simulation is intended to closely approximate the real net assets of the GF to those being used as basis for calculating leverage in each cycle.

k) Lifetime of the GF: The simulation will take place for a period of 120 months. However, since the guaranteed loans have a term of 36 months and the cycles are every 4 months, no new guarantees shall be granted after the 81st month,[14] so that at the end of the 120 months there are no longer loans open, only the credits in arrears which are not be considered in the simulation after the end of the operation of the facility.

l) Initial capital: For illustrative purposes only the value was calculated to attend a market of R$ 80 million per year, a very approximate estimate of the existing volume of projects. Considering that the loans only represent 80% of the investment, the guaranteed credit would be R$ 64 million. Since the leverage of the GF will be 10 times the initial capital, this shall be R$6.5 million.

[13] Also known as “circular reference”, which takes place when one tries to calculate variables which make use of themselves to be calculated.

[14] The explanation for this stop is simple, after the 81st month the next cycle would be the 85th month, however due to the duration of 36 months, this last cycle would finish being paid after the end of the simulation. Therefore we have opted to stop in time for the final cycle to be fully collected. For the effect of the simulation the defaulting credits still not recouped after the 120th month, will not be considered.

5.2. Results of the Initial Simulation of the GF

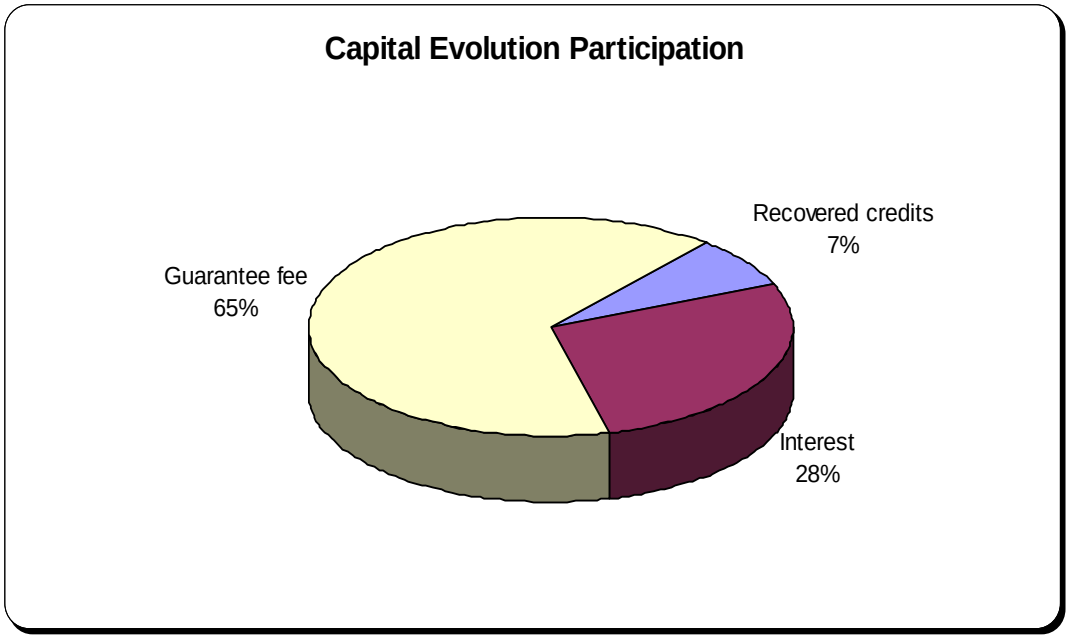
With conditions defined above, the guarantee facility showed itself economically viable (it presented a positive rate of return slightly superior to the interest rate used in the simulation for cash management) and capable of guaranteeing up to R$780 million in energy efficiency projects for the first eight years (an average of nearly R$100 million per year). Taking the estimated rate of return on the assets of the facility (rate for the public bonds which will back up the GF portfolio) as a benchmark, the internal rate of return of the GF came very close. It averaged 12.43% per year, while the average return on the assets, annually was 12.12% - representing a result equivalent to 102.6% of the benchmark. Consider that the effective interest rate in Brazil is among the highest of the world, the rate of return of the GF may be considered very positive, especially since the final intention is not to earn money for the GF, but to support the development energy efficiency industry in the country.

The final capital of the facility after the 120 months simulated reached R$20,976,000. The table below summarizes the contributions to the final capital as does the pie chart in Figure 5.1, in a different way.

Initial capital:	R$6.500 thousand
Guarantee commission fee:	R$66.782 thousand
Interest on applied capital:	R$28.484 thousand
Administrative expenses	(R$9.600 thousand)
Default:	(R$78.795 thousand)
Recuperated credits:	R$7.605 thousand
Final Capital:	**R$20.976 thousand**

Notably, the guarantee commission and the interest on assets entirely cover the costs of default and still generate a sufficient gain to make the fund a viable enterprise financially for its investors.

Figure 5.1

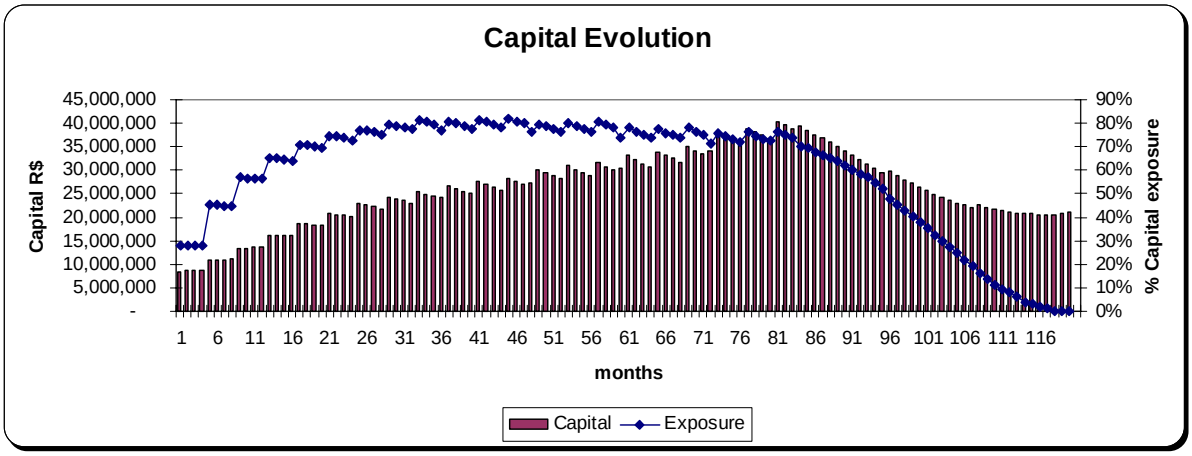


It is worth observing that a substantial part of the gains from interest on assets is due to *floating* during the period in which the cash from the commission fee is with the facility and is not utilized to cover defaults. This results from the fact that the guarantee commission is received in its entirety at the beginning of the operation, while the main disbursements are spread during the terms of the guaranteed credit operations.

From Figure 5.2 it is possible to accompany together the evolution of the capital of the facility and its level of exposure - being that capital exposure is understood to be:

$$\frac{\text{Default rate x Total outstanding loans}}{\text{Total capital of the Facility}}$$

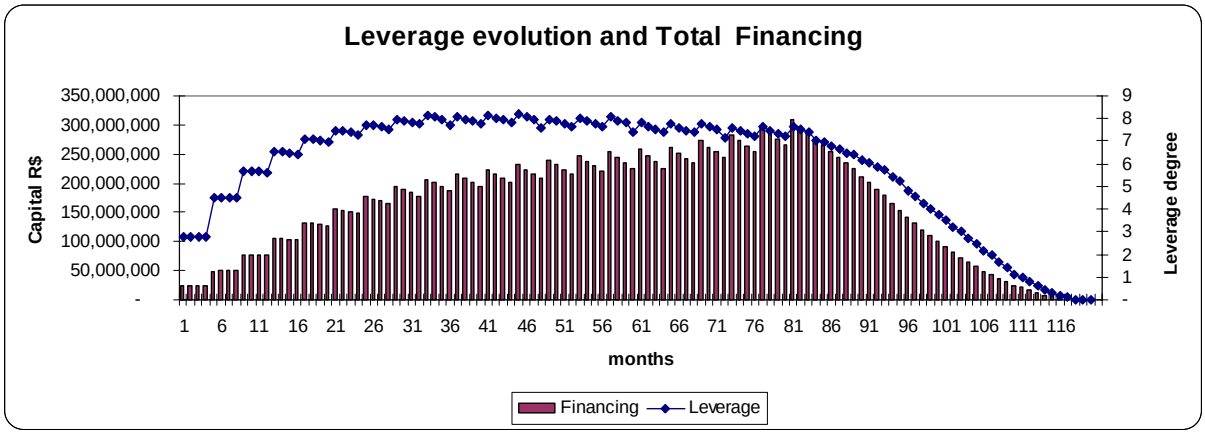
Figure 5.2:



From the graph above it is possible to see that the maximum capital exposure reached is 82% and that this level of exposure was maintained for most of the time. Below is another graph similar to the previous one, which this time presents the total outstanding loans in relation to the level of leverage measured by the following relationship:

$$\frac{\text{Total outstanding loans}}{\text{Total capital of the Facility}}$$

Figure 5.3:



It is possible to accompany the evolution of all the main variables involved in the 120 month lifetime of the GF in Table 5.1, shown below. Each line of the table is a "photograph" of the assets of the facility and of the main accounts which compose its results when the guarantee is liberated every four months.

Table 5.1: Summary Table

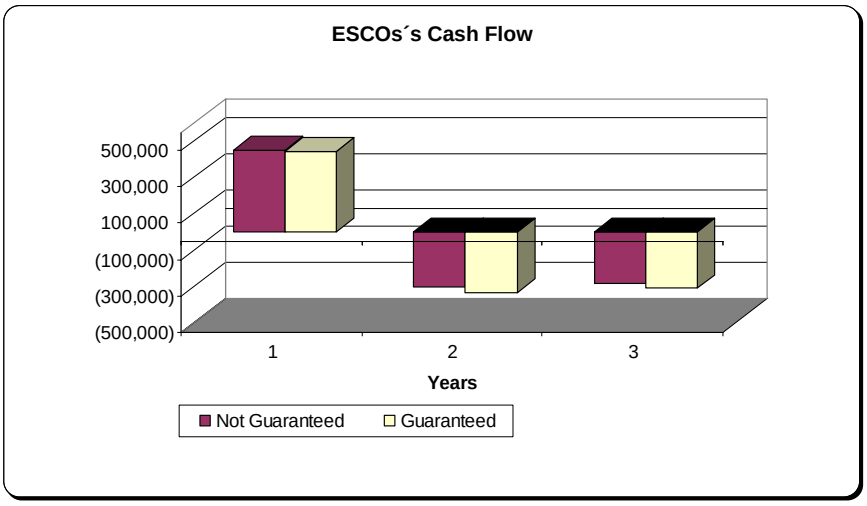
R$ 000

Moths	Capital (amount)	% Capital	Fee	Net insolvency (accumulated	Interest (accumulated)	Administrative expenses	Leverage	Financing
1	8,448	27.8%	2,028	-	-	(80)	2.80	23,695
5	10,750	45.3%	2,146	-	476	(320)	4.56	49,040
9	13,266	56.9%	2,263	-	573	(320)	5.73	75,996
13	15,989	65.1%	2,379	(410)	664	(320)	6.54	104,534
17	18,495	70.8%	2,494	(845)	742	(320)	7.11	131,487
21	20,728	74.7%	2,605	(1,194)	793	(320)	7.50	155,519
25	22,746	77.2%	2,713	(1,789)	819	(320)	7.75	176,321
29	24,273	79.4%	2,816	(2,295)	820	(320)	7.97	193,479
33	25,417	81.1%	2,918	(2,332)	841	(320)	8.13	206,688
37	26,667	80.7%	3,023	(2,942)	879	(320)	8.09	215,809
41	27,456	81.3%	3,132	(3,058)	918	(320)	8.15	223,769
45	28,269	81.7%	3,245	(2,261)	945	(320)	8.19	231,649
49	30,032	79.6%	3,363	(3,424)	981	(320)	7.98	239,657
53	30,806	80.2%	3,484	(3,638)	1,035	(320)	8.05	247,855
57	31,520	80.7%	3,610	(3,019)	1,062	(320)	8.09	255,146
61	33,010	78.0%	3,740	(4,034)	1,090	(320)	7.82	258,105
65	33,662	77.6%	3,875	(3,648)	1,132	(320)	7.77	261,687
69	34,872	77.9%	4,014	(2,605)	1,163	(320)	7.81	272,409
73	37,322	75.9%	4,159	(3,871)	1,216	(320)	7.60	283,758
77	38,734	76.2%	4,309	(4,015)	1,293	(320)	7.64	295,735
81	40,205	76.5%	4,465	(2,972)	1,342	(320)	7.66	308,162
85	38,317	69.5%	-	(4,321)	1,404	(320)	6.97	266,938
89	34,999	63.9%	-	(4,640)	1,323	(320)	6.41	224,170
93	31,238	57.0%	-	(3,232)	1,199	(320)	5.72	178,619
97	28,758	45.4%	-	(3,893)	1,073	(320)	4.56	131,015
101	25,527	35.3%	-	(3,168)	981	(320)	3.54	90,341
105	22,912	24.7%	-	(1,416)	874	(320)	2.48	56,848
109	21,976	14.0%	-	(1,640)	799	(320)	1.40	30,794
113	20,782	6.0%	-	(835)	767	(320)	0.60	12,447
117	20,361	1.0%	-	308	734	(320)	0.10	2,087
120	20,976	0.0%		-	546	(240)	-	-
	20,976	**81.7%**	**66,782**	**(71,190)**	**28,484**	**(9,600)**	**8.19**	**780,260**
	Capital	Max	Total	Total	Total	Total	Max	Total

5.3. Impacts of the GF on the Cash Flow of the ESCOs

In order to verify the consequences of the introduction of the GF on the financial lives of,the ESCOs, the cash flows of these companies were simulated to calculate the effective cost of financing with the guarantee of the facility. As an illustration, two hypothetical situations are considered. In the first situation, the ESCO will obtain the loan as described above, however without the GF - that is, using the same parameters of the simulation except for the guarantee commission fee of 0.26% per month on the loan principal. The second situation is identical to what has been simulated - that is, it includes the cost of the guarantee commission fee.

Figure 5.4



Annual Expenditures

R$

Years	Not Guaranteed	Guaranteed
1	447,369	442,443
2	(305,742)	(334,359)
3	(284,499)	(311,128)
4	-	-
5	-	-

The result of the first simulation is graphically represented in Figure 5.4. In it we can see that the difference between the two simulations takes place basically after the first year, due to the payment related to the guarantee commission jointly with the amortizations of the principal (remembering that the commission was capitalized at the moment the credit was liberated). This form of collection (at the moment of liberation) is the same used in the Guarantee Facility in the operations of BNDES, the FGPC. The advantage for the GF is that it reduces the credit risk and increases the gain from floating. For the ESCO the disadvantage is clear. In order to obtain a loan of R$500,000 in the simulation, it will be necessary to capitalize an additional R$46,800[15] for the guarantee commission to the principal, bringing it to R$546,800. In terms of the rate of return the difference is even more evident: without the GF the cost of the credit would be 14.43% pa, while with the GF the cost of the credit increases to 20.19% pa.

Table 5.2. compares the relative costs for ESCOs assuming different levels of guarantee commissions and different terms for the loans. It shows how conditions other than those assumed in this baseline simulation might effect the relative cost. As expected, increases in either of these two variables increases the final cost for the credit borrower

Table 5.2: Comparative Chart of Costs for the ESCOs

Period	Grace period	Not Guaranteed	Guaranteed			
			0.10%	0.15%	0.20%	0.26%
18	12	15.08%	16.79%	17.64%	18.49%	19.50%
24	12	14.87%	16.80%	17.75%	18.71%	19.86%
30	12	14.64%	16.74%	17.78%	18.82%	20.06%
36	12	14.43%	16.66%	17.77%	18.88%	20.19%
48	12	14.04%	16.50%	17.71%	18.92%	20.36%
60	12	13.71%	16.35%	17.65%	18.94%	20.47%

[15] R$46.8 thousand = R$500 thousand x 0.26% x 36

It is important to observe that the simulations above were made ignoring their impacts on the economic viability of the GF. With commissions below 0.26% (breakeven point where the GF presents a rate of return close to its benchmark with the baseline premises) it is expected that the GF will not only achieve a level of capital lower than the initial, but that new capital inputs would be needed from the investors.

For the lower commissions to be practiced by the GF it is necessary that some of the baseline assumptions be "redone", especially concerning the expected default rate and the average term of the projects in the portfolio (since the revenue from the guarantee commission is directly proportional to the term of the financing). In order to better illustrate this trade-off between "less default and lower commission" or "longer term and lower commission" the two graphs which follow show the new breakeven commissions (keeping all other conditions constant).

Figure 5.5

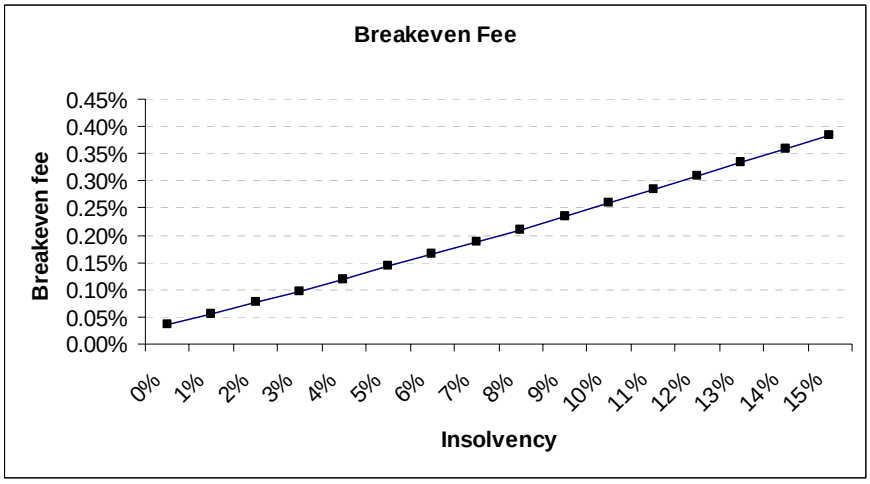
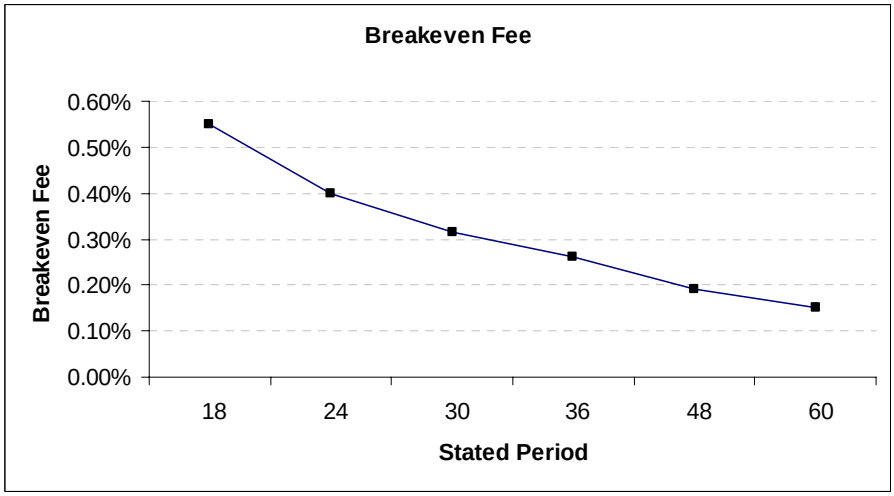


Figure 5.6



The two graphs (Figures 5.5 and 5.6.) clearly illustrate the necessity of revising the baseline assumptions if the guarantee commission fees are to be reduced in favor of the ESCOs.

5.3.1. Effects of the term on the guarantee commission and on the cash flow of the ESCOs

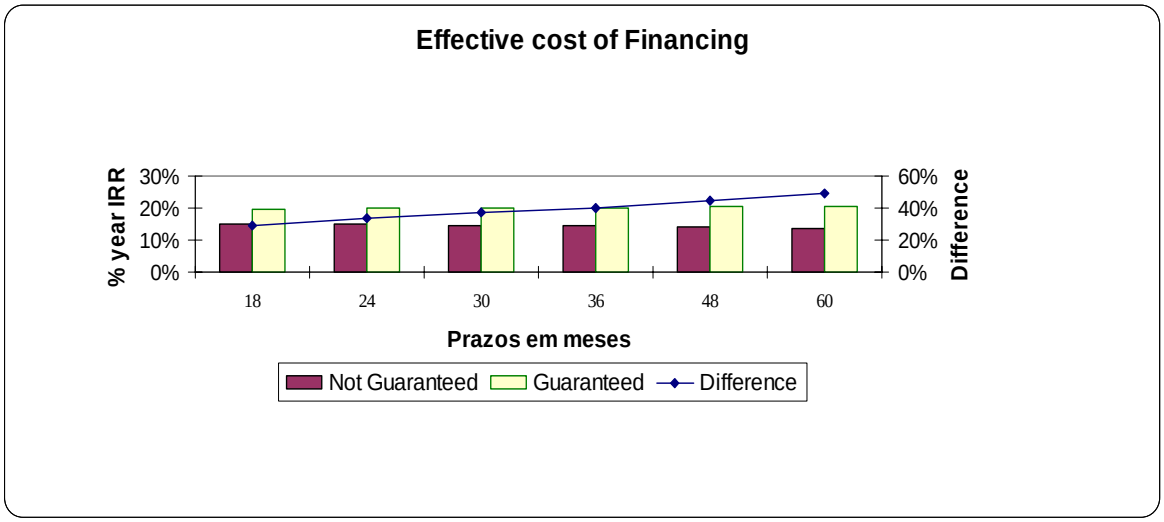
For different terms (in months) differences were identified between the two situations (loan with and without the guarantee). The analysis shows a clear tendency of increasing distance between the costs of the two options as the term of the loan is dilated. In the analysis, the same grace period, twelve months, was assumed.

It can be seen from Table 5.3 and more clearly from Figure 5.7 that the cost is positively correlated with the term of the credit, that is, the operations with a term of 60 months are relatively more expensive than those of 18 months.

Table 5.3: Comparative Table

Period	Grace period	Not Guaranteed	Guaranteed	Difference
18	12	15.08%	19.50%	29.33%
24	12	14.87%	19.86%	33.54%
30	12	14.64%	20.06%	37.00%
36	12	14.43%	20.19%	39.96%
48	12	14.04%	20.36%	45.00%
60	12	13.71%	20.47%	49.34%

Figure 5.7:



Clearly this type of comparison is merely illustrative and in no way represents the reality of the ESCOs since they do not have access to the credit market as described in the "no guarantee" situation, otherwise the entire discussion concerning the GF would be senseless. Thus, despite the clear impact of the GF on the effective cost of the credit, it is important to highlight that the situation without the GF is truly unreal given the difficulty, explained earlier, for the ESCOs to obtain financing in the market in the way other consolidated industries are able to obtain it.

Considering the financial reality of the companies, it would be fairer to compare the cost using the GF with a loan obtained in the credit market for small companies without real guarantees or for individuals. In these cases it is unlikely that the rate would be below 40% pa, that is, well above the highest simulated rate (for a term of 60 months) with the GF.

5.4. Sensitivity Tests for the Guarantee Facility

Given the positive results obtained in the first simulation, it is important to verify if this good outcome would allow the facility to respond well even when submitted to more negative scenarios. The idea of this subchapter is to demonstrate how the fund is sensitive to each of the factors that influence its performance, that is, present sensitivity tests to estimate what may happen with the Guarantee Facility in case the estimated variables of the baseline case are not confirmed during its lifetime.

Therefore, in this subchapter other scenarios are considered in the simulation, with the objective of evaluating the capacity of the GF to "survive" more negative situations as well as to attempt to identify the most adequate scenario for the GF, for the ESCOs themselves and for the financial market.

5.4.1 Alterations in the terms of the financing of the ESCOs:

The first sensitivity test to which the GF was subjected refers to the term of the financing of the ESCOs. As seen in the end of the previous subchapter, the term used in the simulation, 36 months, resulted in an annual effective cost of approximately 20% for the borrowers. The cost is a direct function of the term of the credit guaranteed by the facility. However not only the cost of the ESCO is a function of the term, but the revenue from the "float" of the guarantee commission. For this test the same analysis periods of the cash flow of the ESCOs were used, terms of 18, 24, 30, 36, 48 and 60 months.

Table 5.4 Sensitivity to the term of the loan

		Profit/Loss				IRR of th Fund
Period	Final Capital	Fee	Interest	Net insolvency	Expenses	% of benchmark
18	(61,710)	45,821	(11,130)	(93,301)	(9,600)	N/A
24	(29,940)	54,111	2,992	(83,942)	(9,600)	N/A
30	(2,891)	63,500	16,687	(79,978)	(9,600)	N/A
36	20,976	66,782	28,484	(71,190)	(9,600)	102.59%
48	58,368	71,797	48,846	(59,175)	(9,600)	202.59%
60	82,301	70,365	62,898	(47,862)	(9,600)	238.53%

As can be seen from Table 5.4, the shorter terms do not allow the expressive gain from floating that the facility has with terms of 36 to 60 months. In the first cases the facility ended up with negative assets, which in practice would have meant the need for new inputs by the investors. At 36 months, the commissions received for the guarantees enough to cover the cost of the defaults honored by the GF. With shorter terms the cost of the defaults becomes more concentrated in time, stopping the fund from investing the commission income and receiving the interest over a period of time, as takes place when the terms exceed 36 months.

The first conclusion one can draw from this analysis is that for operations with longer terms (more than 36 months) the guarantee commission may be reduced. It can be smaller due to the gains that the GF may have with the pulverization of defaults over time and by the interest it accumulates from the investment of the commission income in its portfolio. At first sight the statement above may seem contradictory, as it would lead some to think that credits with longer terms are less risky for the portfolio of the GF. However, what is in fact behind the possibility of reducing the commission is that the gain from a longer term is greater than the increase in defaults, which will clearly take place when the terms are dilated.

Analogously, if we expect a portfolio with operations which do not exceed two years, the guarantee commission fee should be increased in order that the GF can remain a viable instrument.

Table 5.5. summarizes simulations to estimate what would be the breakeven commissions resulting from the terms analyzed above, if the target IIR of the GF is the benchmark rate of 12.12% (interest rate on the assets of the GF).

Table 5.5: Breakeven Commissions

Period	Breakeven fee
18	0.543%
24	0.401%
30	0.314%
36	0.260%
48	0.190%
60	0.151%

From the table it is possible to verify that for longer terms (of 5 years) the equilibrium commission is very close to the commission charged by the FGPC (0.15%). However, it is important to make it clear that there were no changes in the estimated rate of default in the baseline case (10% of the portfolio).

As an illustration, Table 5.2 (which compared the final cost of credit with and without the guarantee) was redone in Table 5.6, now adding the breakeven commissions calculated above for each term:

Table 5.6: Comparative Table – No Guarantee x GF x breakeven GF

Period	Grace Period	Not Guaranteed	Original Fund	Breakeven Fund
18	12	15.08%	19.50%	24.30%
24	12	14.87%	19.86%	22.54%
30	12	14.64%	20.06%	21.18%
36	12	14.43%	20.19%	20.19%
48	12	14.04%	20.36%	18.68%
60	12	13.71%	20.47%	17.66%

From the table it we can verify that with the differentiated guarantee commission it is possible to reduce the commission (and credit) cost for the ESCOs in longer term operations while increasing it when the average term is shorter than 36 months. The degree of change in fees would depend on a closer evaluation of the change in default rates going from shorter to longer terms.

5.4.2 Sensitivity to the default rate

The most delicate variable in the life of the GF is the default rate. The rate of 10% used in the simulation is already considered to be conservative in view of the data issued by the Central Bank of Brazil.concerning defaults in credit operations linked to the acquisition of assets by companies. Table 5.7 shows the volume of credits in default in this modality in recent years.

Table 5.7: Default Rates in Brazil

Fixed Income operations - Good Aquisitions by firms

R$ millions

Period	New issues		Balance					
			Delay ranges				Total Amount	% of delays
	Total month	Daily average	No Delay	15 a 30 days	31 a 90 days	Above 90 days		
2002 average	424	20	2 843	71	85	71	3 071	7.41%
2003 average	534	25	3 149	71	87	78	3 381	6.98%
2004 average	864	41	5 108	67	81	83	5 339	4.32%

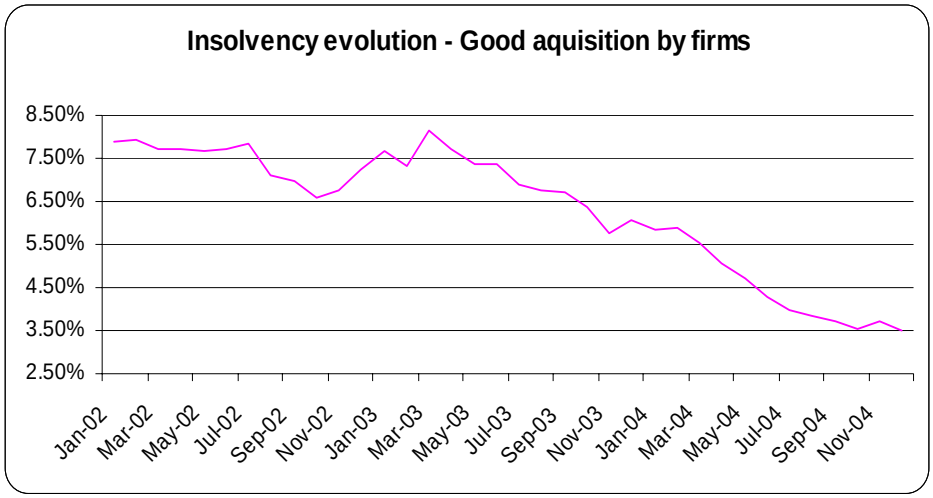
Source: Central Bank of Brazil – Credit Operations – Consolidated Data[16]

For a clearer analysis, a graph was prepared showing the evolution of the monthly default rate during the three most recent (Figure 5.8). It can be seen that the rate of default practically always remained below 8%, and in the last year (2004) presented a significant decrease,

[16] www.bcb.gov.br

stabilizing at around 4%. It should be considered that the data in the table does not reveal the size of the defaulting client, placing together small, medium and large companies. However the difference between the rate assumed in the baseline simulation and one calculated from the data of the Central Bank suggests a large margin of conservatism.

Figure 5.8.: Evolution of Defaults of Companies Acquiring Equipment



It is also relevant that to observe that, historically, the rate of default of the clients with ESCOs has been low as was discussed in chapter 2.

As an illustration, assuming the term of 36 months used in the baseline simulation, if the initial default of 10% were reduced by 0.5% per semester until it reached 7.5% the GF would achieve rate of return of 22.33% pa (equivalent to 184% of the benchmark) and a final capital of R$48,783,000. Conversely, the GF could charge a guarantee commission of 0.20% and still achieve a rate of return close to the benchmark.

On the other hand, scenarios with a default rate above the 10% of the baseline simulation result in a very inferior performance of the GF, implying the loss of capital or even negative assets, which would make new inputs of capital by the investor necessary. Table 5.8 shows a sample of the return of the GF with different levels of default (constant through the life of the facility) and 36 month loan operations, remembering that the benchmark return for the facility in this period is 12.12%.

Table 5.8: Sensitivity to Default

Default Rate	IRR (year)	% benchmark	Final Capital (R$ 000)
2,5%	32,29	266,48	106.666
5%	28,23	232,97	78.103
10%	12,43	102,59	20.976
12,5%	N/A	N/A	-7.588
15%	N/A	N/A	-36.151

In the last cases with higher default rates, the capital of the GF ended up after 120 months with negative assets. To minimize this effect it would be necessary that the GF seek to include operations with longer terms in its portfolio, such as, for example, credits of 4 to 5 years, or increase the commission fee for the guarantees. In relation to seeking the longer term credits, the income from guarantee commissions is higher, which increases the gain from "floating". Even if the breakeven guarantee commissions were used (calculated in the preceding subchapter), the performance of the GF would be improved in the cases of higher defaults due to the longer term that the GF would have to work the resources of the commission fee before having to use them to cover defaults.

By way of comparison, the same analysis of sensitivity to default was made for operations with terms of 24 and 48 months using the guarantee commission of 0.26% (baseline) and the respective breakeven commissions presented in Table 5.5, which results in the cost of credit remaining practically unaltered in percentage and absolute terms for the borrower, independent of the term.

Table 5.9: Sensibility to Default (loan term 24 months)

Default Rate	% Benchmark IRR		Final Capital (R$ thousand)	
	Baseline fee	Breakeven fee	Baseline fee	Breakeven fee
2,5%	221,91	282,98	70.318	123.936
5%	156,51	247,43	36.899	89.452
10%	100,40	100,40	-29.940	20.485
12,5%	N/A	N/A	-63.659	-13.999
15%	N/A	N/A	-96.778	-48.482

For a portfolio with average terms of 24 months, the commission of 0.26% (calculated for the average term of 36 months) leads towards negative assets in the case of defaults equal to or greater than 10%. However, for lower defaults the portfolio performed substantially above its benchmark, which could suggest an increase in leverage or a reduction in the guarantee commission (the choice of the options would depend on the demand for the product). As an illustration, for the two lower default alternatives, the breakeven commission for the GF would be respectively 0.13% and 0.22%.

Table 5.10: Sensitivity to Default (loan term 48 months)

Default Rate	% Benchmark IRR		Final Capital (R$ thousand)	
	Baseline fee	Breakeven fee	Baseline fee	Breakeven fee
2,5%	288,44	248,16	130.172	90.064
5%	266,04	216,63	106.237	68.847
10%	202,59	100,06	58.368	20.411
12,5%	149,75	N/A	34.433	-2.806
15%	40,54	N/A	10.499	-26.024

In the case of the portfolio of 48 months, despite closing with negative assets for the more extreme scenarios of default, the GF had a slightly better performance, which can be attributed to the increase in revenue from guarantee commissions and gains from floating. Again, as an illustration, for the two lower default alternatives, the breakeven commission for the GF would be respectively 0.07% and 0.11%.

Given the levels of default registered by the Central Bank and all the analyses that will be carried out to approve the guarantee operations of the GF (described in chapter 4) it is expected that there should be space to significantly reduce the baseline guarantee commission fee as it is confirmed that the default rate is lower than forecast in the simulation.

5.4.3 Concerning the Guarantee commission:

The guarantee commission fee is always calculated as a function of the other variables in the model. In other words, given these variables, the Guarantee commission will be calculated so that the GF presents a rate of return which makes it viable without burdening the ESCOs unnecessarily. In the baseline simulation the guarantee commission used was that which, given the variables, equalized the return of the GF with the interest rate of the investment portfolio (12.12% considered here as the benchmark).

The GF is very sensitive to alterations in the guarantee commission fee as can be seen from Table 5.11, which shows what the return of the GF would have been in the baseline scenario for each level of commission.

Table 5.11 Effect of alterations of the Guarantee commission in the GF (term 36 meses)

Guarantee commission	IIR % *benchmark* (per year)	Final Capital (R$ thousand)
0,216%	-232,65	237
0,26%	102,59	20.976
0,28%	137,68	30.402
0,30%	164,04	39.829

For guarantee commissions lower than 0.216%, the GF presents negative assets, which would make it necessary to have extra capitalization by the investors for its survival. The sensitivity to decreases in the guarantee commission is inversely proportional to the average term of the operations of the portfolio of the GF.

Tables 5.12 and 5.13 demonstrate this last statement, summarizing the effects of the guarantee commission on portfolios with average financing terms of 24 and 48 months.

Table 5.12 Effect of alterations of the Guarantee commission for the GF (term 24 months)

Guarantee commission	TIR % *benchmark* (per year)	Final Capital (R$ thousand)
0,26%	N/A	-29.940
0,30%	N/A	-15.635
0,35%	-83,20	2.246
0,375%	46,05	11.187
0,40%	98,77	20.127
0,45%	159,43	38.008

Table 5.13 Effect of alterations of the Guarantee commission for the GF (term 48 months)

Guarantee commission	TIR % *benchmark* (per year)	Final Capital (R$ thousand)
0,26%	202,59	58.368
0,20%	122,46	25.926
0,19%	100,55	20.520
0,175	55,13	12.409
0,153	-184,98	514

With an average term of 48 months the GF can charge a commission fee lower than that charged with the 24 month portfolio. The breakeven commission was highlighted (yellow shading in the tables) to better compare what would be the commissions charged for each case if the intention was to obtain with the GF a return rate close to market values and still support the energy efficiency industry.

It is worth observing that the breakeven commissions for terms from 24 to 48 months do not vary much for the final borrower, either in terms of value or in terms of the effective interest rate, as summarized below.[17]

48 x 0.19% x 500,000 = **R$45,600** with an annual rate of **18.68%**

36 x 0.26% x 500,000 = **R$46,800** with an annual rate of **20.19%**

24 x 0.41% x 500,000 = **R$49,200** with an annual rate of **22.54%**

5.4.4 Sensitivity to leverage

In the initial simulation the degree of annual leverage was kept constant, at 10 times the assets of the facility adjusted by the return on the assets. For each new cycle, the volume of guarantee to be granted is calculated considering the net assets of the fund, adjusted to the date in question by their rate of return. From this “adjusted assets” value, the volume of guarantee is obtained by multiplying this value by the leverage limit and then dividing by the number of cycles of liberations in the year (in the case of these simulation, 3 times). This calculation procedure for the simulation generated a maximum exposition - calculated simply as the ratio between outstanding loans guaranteed over the net assets of the capital reserve - of 8.2 times.

In view of the perspective of viability of the GF, scenarios were prepared considering the possibility of increasing the leverage during its life time become interesting.

It is worth remembering that the level of leverage has a direct influence on the volume of guarantees granted and consequently on the income of the GF through the guarantee commissions collected. On the other hand, an excessively leveraged facility has a far greater

[17] Remembering that the formula for the calculation of the guarantee commission is the product of the term (in months) of the commission ant the principal of the operation.

exposure to default. Its greater sensitivity to oscillations in the default rate makes the facility more likely to operate with a capital exposure superior to 100%.

In order to evaluate the effect of the alterations on the leverage rate on the behavior of the facility, two alternatives were simulated. The first assumes a smaller leverage than the baseline at the beginning, eight times, increasing annually by one unit until a limit of fifteen times. Over the lifetime of the facility the average leverage is slightly greater than in the baseline simulation. The second alternative assumes the same beginning as the baseline, ten times, however increasing annually by one until it reaches the same level as the first alternative, fifteen times.

In order to better demonstrate the effects of the changes in the leverage rates, Tables 5.14 and 5.15 below are comparative charts of the two cases with annual "photographs" of the GF's status. There were no alterations in the other variables of the GF (not even in the administrative expenses considering that there should be economies of scale with the increase of projects in the portfolio).

1st Alternative – With an initial leverage of eight times going up to fifteen, the GF had a rate of return of 13.44% or 110.90% of the benchmark - slightly above the baseline simulation which earned 12.43% or 102.59% of the benchmark).

Table 5.14: Summary Chart

R$ 000

Moths	Capital (amount)	% Capital	Fee	Net insolvency (accumulated	Interest (accumulated)	Administrative expenses	Leverage	Financing
1	8,042	23.3%	1,622	-	-	(80)	2.36	18,956
13	14,326	60.0%	2,141	(328)	596	(320)	6.03	86,407
25	20,824	74.8%	2,713	(1,479)	738	(320)	7.50	156,258
37	25,887	80.7%	3,326	(2,611)	834	(320)	8.09	209,545
49	31,198	82.0%	4,035	(3,396)	997	(320)	8.23	256,605
61	36,558	82.5%	4,862	(4,437)	1,181	(320)	8.27	302,261
73	44,069	81.9%	5,823	(4,613)	1,403	(320)	8.20	361,569
85	46,926	76.6%	-	(5,598)	1,721	(320)	7.67	359,838
97	34,161	52.8%	-	(5,302)	1,285	(320)	5.29	180,652
109	24,596	17.5%	-	(2,296)	901	(320)	1.75	43,111
120	22,933	0.0%		-	594	(240)	-	-
	22,933	**84.4%**	**76,440**	**(81,210)**	**30,803**	**(9,600)**	**8.46**	**893,105**
	Capital	Max	Total	Total	Total	Total	Max	Total

2nd Alternative – With leverage increasing from ten to fifteen times, the GF had an internal rate of return of 14.99% (123.73% of the benchmark). However, both the capital exposure (86.2%) and the effective leverage (8.64) are somewhat higher than in the baseline simulation, as discussed below:

Table 5.15: Summary Chart

R$ 000

Moths	Capital (amount)	% Capital	Fee	Net insolvency (accumulated	Interest (accumulated)	Administrative expenses	Leverage	Financing
1	8,448	27.8%	2,028	-	-	(80)	2.80	23,695
13	16,227	65.8%	2,617	(410)	664	(320)	6.61	107,314
25	24,101	79.2%	3,256	(1,837)	850	(320)	7.95	191,522
37	30,006	84.0%	3,930	(3,199)	967	(320)	8.42	252,707
49	36,055	84.3%	4,708	(4,081)	1,152	(320)	8.45	304,536
61	42,083	83.9%	5,610	(5,244)	1,360	(320)	8.41	353,882
73	50,123	82.4%	6,239	(5,388)	1,610	(320)	8.25	413,461
85	52,315	76.0%	-	(6,365)	1,921	(320)	7.61	398,115
97	38,077	51.5%	-	(5,839)	1,431	(320)	5.16	196,522
109	27,839	16.5%	-	(2,460)	1,016	(320)	1.66	46,190
120	26,275	0.0%		-	681	(240)	-	-
	26,275	**86.2%**	**88,503**	**(94,088)**	**34,960**	**(9,600)**	**8.64**	**1,034,046**
	Capital	Max	Total	Total	Total	Total	Max	Total

It can be seen in the summary charts above that, despite the increase in the leverage rate, in none of the cases has the capital exposure reached elevated percentages that would in fact compromise the continuity of the GF. Further analysis of leverage rates increasing over time is therefore interesting. It could also substantially increase the portfolio of guarantees during the facility's lifetime. Both alternatives presented a rate of return higher than that in the baseline simulation as well as a significantly larger volume of guaranteed credits - from R$780 million in guarantees in the baseline to R$890 and R$1,030 million respectively.

5.4.5 Benchmark Alterations

During all simulations the initially defined benchmark was not altered. To the contrary, it served as a reference for all calculations. It represents a kind of target that should be reached to assure the economic viability of the investment in the GF - that is, making the creation of the GF positive not only for the energy efficiency industry, but also for the investors who provided funds for it.

The benchmark was initially determined as being the average return on the assets of the GF, close to the rate of return of Brazilian Federal public bonds (SELIC). However, as an illustration, we present two other benchmark alternatives in Tables 5.16 and 5.17. The first uses the rate of the TJLP (defined quarterly by the National Monetary Council). In the second the benchmark rate is zero, that is, the final capital of the GF after 120 months of simulation will be equal to the initial capital (R$6,500,000).

Table 5.16 Summary Chart (benchmark = TJLP = 6.79%)

R$ 000

Moths	Capital (amount)	% Capital	Fee	Net insolvency (accumulated	Interest (accumulated)	Administrative expenses	Leverage	Financing
1	8,308	28.1%	1,888	-	-	(80)	2.84	23,555
13	15,335	67.4%	2,215	(407)	641	(320)	6.78	103,918
25	21,456	81.4%	2,526	(1,779)	775	(320)	8.17	175,282
37	24,646	86.8%	2,815	(2,925)	816	(320)	8.70	214,537
49	27,141	87.5%	3,131	(3,404)	888	(320)	8.78	238,244
61	29,085	88.0%	3,482	(4,011)	961	(320)	8.82	256,584
73	32,162	87.5%	3,873	(3,848)	1,046	(320)	8.77	282,086
85	32,008	82.7%	-	(4,296)	1,183	(320)	8.29	265,365
97	21,817	59.5%	-	(3,870)	831	(320)	5.97	130,243
109	14,308	21.3%	-	(1,631)	532	(320)	2.14	30,612
120	12,537	0.0%		-	325	(240)	-	-
	12,537	**90.4%**	**62,183**	**(70,771)**	**24,225**	**(9,600)**	**9.07**	**775,662**
	Capital	Max	Total	Total	Total	Total	Max	Total

Table 5.17 Summary Chart (benchmark = 0%)

R$ 000

Moths	Capital (amount)	% Capital	Fee	Net insolvency (accumulated	Interest (accumulated)	Administrative expenses	Leverage	Financing
1	8,208	28.3%	1,788	-	-	(80)	2.86	23,455
13	14,866	69.2%	2,098	(406)	624	(320)	6.96	103,477
25	20,534	84.7%	2,393	(1,771)	745	(320)	8.50	174,538
37	23,200	91.8%	2,666	(2,912)	770	(320)	9.21	213,627
49	25,073	94.3%	2,965	(3,390)	822	(320)	9.46	237,234
61	26,276	96.9%	3,298	(3,994)	870	(320)	9.72	255,496
73	28,469	98.4%	3,668	(3,831)	924	(320)	9.87	280,890
85	27,494	95.8%	-	(4,277)	1,026	(320)	9.61	264,239
97	16,850	76.6%	-	(3,853)	658	(320)	7.70	129,690
109	8,823	34.2%	-	(1,624)	341	(320)	3.45	30,482
120	6,500	0.0%		-	167	(240)	-	-
	6,500	**102.3%**	**58,893**	**(70,470)**	**21,177**	**(9,600)**	**10.26**	**772,371**
	Capital	Max	Total	Total	Total	Total	Max	Total

From the charts above it can be verified that in both situations, when the benchmark return is reduced the value at the end of 120 months is lower than that of the baseline case (with a benchmark of 12.12% and final capital of R$20,976,000). Therefore it is expected that a reduction of the guarantee commission is possible. However, this reduction ends up being very small when compared in absolute value of the commission in the baseline. In the first case, with the benchmark equal to the TJLP, the breakeven commission remains at around 0.24% (that is, only 0.02% below the baseline of 0.26%). In the second case, where the final capital is equal to the initial, the decrease is slightly greater but still very modest, reaching 0.23%.

Thus in both cases the reduction in the guarantee commission showed itself to be marginal. This effect can be better explained when we analyze the volume of credit guarantees and the reduction that every 0.01% represents for the final capital. Clearly, if in the baseline simulation the final capital was around R$21 million, there is a decrease in capital on the order of R$8.5M in the first case. The comparison of tables 5.16 and 5.1 allows a better analysis of the factors that contribute towards the decrease of the final capital, and, therefore, the identification of the reasons why the reduction of the commission is so insignificant.

As has been explained in preceding sections, two main factors contribute positively to the final capital of the GF: the guarantee commission and interest on invested cash. With the reduction of the target for the final capital, it becomes possible to reduce the guarantee commission, but the effect that this reduced target has on the interest from invested capital cannot be ignored - since this gain from "floating" (with the expected default rate) is in essence what allows the leverage of the GF. Therefore, a decrease of R$8.5 million in the capital of the GF will not be totally reverted to a lower guarantee commission. Comparing the tables above, only half of this causes a reduction of the guarantee commission, the other half is compromised with the decrease of interest income on the capital of the GF. Thus the reduction in the commission indeed ends up being marginal.

5.5. Alterations in the administrative costs and other possible alterations

Among other possible changes related to the cost of the operation, only administrative costs may have greater effects on the viability of the facility. The remainder, if they affect the GF, only slightly alter the structure of its financial flows.

For example, alterations in the spreads of the banks and of the source of the resources do not present any alteration for the GF once it is only guaranteeing the capitalized principal of the operation. Alterations in the spreads only impact the final borrowers and the banks involved.

Pessimistic alterations in the estimates for market interest rates (TJLP and rate for public bonds) also do not have important impacts on the fund, as they would be altering not only the liabilities (basis of default), but also the assets (rate of return rate on assets), in a manner that the net effect in reality should be positive for the facility. The TJLP only indirectly influences the volume of default that will be covered (this is a reason why the portion of TJLP exceeding 6% is capitalized), whilst the interest rate directly influences the rate of return of the invested capital.

For example, if there were no alterations in the initial interest rates of the assets and in the TJLP (in the baseline both of these decline over time as described in section 5.1), the GF would present a return rate of 23.73% (against a new benchmark of 18.86% - equivalent to 125.82%). In this analysis the influence that the interest rate has on the rate of default was not taken into account; we have assumed the baseline default rate.

On the other hand, alterations in the transaction and administrative costs can have direct impacts on the viability of the GF. As defined in chapter 4, the monthly costs were estimated at approximately R$80 thousand.

These costs, as well as the estimated default rate for the portfolio, will guide the choice of the guarantee commission. The commission of 0.26% chosen for the baseline simulation, as well

as the other commissions classified as breakeven for the other simulations always assumed the costs cited above.

Table 5.18 below summarizes the effect of percentage alterations of the original values, both upwards and downwards, on the rate of return of the GF. It then shows what the guarantee commission should be to again equalize the return of the GF with the benchmark, considering the same average term of the baseline simulation (36 months).

Table 5.18: Sensitivity to administrative costs (in R$)

Modification	Monthly cost (R$)	Yield	% *Benchmark*	New fee
-20%	64,000	14.15%	116.79%	0.251%
-10%	72,000	13.32%	109.93%	0.255%
0%	80,000	12.43%	102.59%	0.260%
10%	88,000	11.47%	94.68%	0.262%
20%	96,000	10.43%	86.11%	0.266%
30%	104,000	9.30%	76.75%	0.270%
50%	120,000	6.65%	54.89%	0.277%

From the table it can be seen that in order to compensate the greater or smaller expense, the guarantee commission must slightly increase or decrease, respectively. That is, the commission is not very sensitive to changes in administration costs.

6. Conclusions and Recommendations

In the first three chapters of this report we have described the context for financing energy efficiency projects in Brazil and sought to justify the creation of a Guarantee Facility with preponderantly public resources.

A basic proposal for a Guarantee Facility was described in Chapter 4 and subjected to sensitivity tests in Chapter 5. In preparing this model, the authors sought to learn from the experience with existing guarantee facilities to access lines of credit from the BNDES, as well as addressing the specific conditions of the market for EE projects. The proposed model differs in some important ways from the existing guarantee facilities in Brazil.

- The coverage of the loan principle is complete, not partial. It is also expected that no additional guarantees will be required by the bank making the loan.
- Execution of the guarantee is immediate and does not require the bank to initiate formal bankruptcy procedures against the client.
- The market covered by the guarantee is much more specialized, with a much smaller number of agents.
    - The initial capital for the facility will also probably be significantly smaller.
- The entity managing the Guarantee Facility would perform the due diligence and have direct relations with the borrowers as well as the banks.
    - The existing facilities have no relations with the borrowers and only evaluate the overall default rate of the banks' portfolios covered by the guarantee.
- Instead of a single commission fee rate, it is proposed that a graduated scale of rates be developed which takes into account the risk and term of the operation.

Like existing guarantee facilities, the commission would be capitalized into the loan principle "up front".

The model assumes that the initial capital for the facility is not grant money and that the initial capital will not only be preserved but grow at a benchmark return rate (12.12% in the Baseline Case described in Chapter 5. This level of return is certainly too low to attract private investors. The capital must therefore come from a public financial agent such as the BNDES, FINEP, regional development banks etc. However, unlike existing guarantee facilities, it is proposed that this facility be managed by an entity outside the bank originating the credit which is contracted specifically for this task. This is due in large part to the more labor-intensive nature of the operations, which involve direct contact with the borrowers.

A preliminary draft of this report was prepared and distributed in early April and May. Subsequently, there were presentations and discussions with the BNDES and review meetings were held on June 1 and June 10, involving both ESCOs, financial agents and the BNDES.[18] This review process showed a broad acceptance of the basic model by the diverse agents. At the same time, the review highlighted:

- The cost of the guarantee commission is high in the Baseline Case and is unviable for many projects. Nevertheless, a GF would still be worthwhile, especially since there is a good chance to reduce the cost of the guarantee.
- The main way to attain lower costs would be to achieve a lower default rate than the 10% conservatively assumed.

[18] The June 1 review meeting was a videoconference at the BNDES. The June 10 meeting was organized by ABESCO and held in FIESP.

    - Assuming a 5% default rate would reduce the average monthly commission from 0.26% to 0.15% - the level of existing guarantee facilities for BNDES credit.
- It is necessary to keep the transaction costs of the assessment process as low as possible.
    - Coordinate the due diligences of the bank and the GF so as not to create unnecessary transaction costs for the borrower, as well as to reduce the overall costs of the operation.
    - Public sector support to reduce operational costs would be very helpful, especially during the first several years. There must be resources for training & divulgation, developing detailed operational procedures, international exchanges, etc.
- The turn-around time for project assessment decisions must be kept as short as possible.
- It is necessary that the commercial banks intermediating the BNDES credit accept the Facility's guarantee as being both primary and sufficient.

The review also highlighted the importance of the Guarantee Facility, confirming the priority given by ABESCO since its founding in 1997. Besides facilitating access to bank credit, a GF can also improve the context for attracting third party equity from investment funds, etc. Utilities using public benefit wirecharge resources for projects with ESCOs have so far not leveraged these resources with bank credit. A major barrier has been the need for guarantees, which the Guarantee Facility would address.

The Guarantee Facility can thus play a key role in transforming the market for EE services. With a small initial investment, a large volume of projects can be covered over the lifetime of the facility – R$780 million in 8 years in the Baseline Case with an initial capital of R$6.5 million. In comparison, most existing public and wirecharge programs with grants for specific projects have little leverage – and when the grants stop the projects will stop.

This report has both argued for the need for government support for a Guarantee Facility and developed a basic proposal which the authors believe addresses key issues for the viability and effectiveness of the facility. Although parameters such as the size, lifetime, leverage and administrative costs of the proposed facility are preliminary, it is the most systematic review of the theme yet undertaken in Brazil and provides an objective reference for a serious subsequent effort to design and implement an effective Guarantee Facility.

The question now is whether there is the political will within the Brazilian Government to invest the relatively small resources needed to make a Guarantee Facility a reality. This is almost the same as asking whether the Brazilian Government gives any importance to developing the sector of energy efficiency services in the country.

ANNEXES

Annex A: Legal Aspects of Existing Guarantee Facilities

Carlos Frederico Hackerott and Mariana Campos

We present brief considerations with respect to the guarantee facilities.

a) Inexistence of general norms/rules

In the first place, we make the reservation that there are no general norms or rules for the incorporation and operation applicable to all guarantee facilities. Each one of them possesses its own rules concerning incorporation, operation and termination. Because of this, a great part of the considerations below have taken as their basis rules pertaining to specific guarantee facilities, especially, the FAMPE (initials in Portuguese for Guarantee Facility for Micro and Small Companies), FGPC (initials in Portuguese for Guarantee Fund for the Promotion of Competitiveness), FUNPROGER (initials in Portuguese for Guarantee Facility of Proger), which are the most widely disclosed by the media.

Mainly in relation to the private guarantee facilities, it is still more difficult to obtain access to experiences concerning their operation, as their regulations are not set out in laws or other norms of public nature.

b) Concept and nature of the guarantee facilities

The guarantee facilities do not have a separate legal status, in general they have a strictly accounting nature. There are even specific accounting statements for the guarantee facilities, so that the control of their use is made in a precise manner.

"The Guarantee Facility consists of a mechanism for the concession of guarantees complementary to the contracting of credit for the financing of investments by the companies before financial institutions.

The guarantee is granted by means of endorsement, formalized by the fund, which guarantees a part of the financing. In case the company taking the credit defaults, the fund shall fulfill the part of the financing guaranteed before the financial institution and shall become the new creditor." (citation extracted from the site of CIESP)

As commented above, the funds in general do not posses a separate legal status, consequently, they cannot sign contracts, commitments, consortiums or any other instruments. Only the entity to which the fund is subordinated has powers for such.

Therefore, the entities to which the guarantee facilities are linked /subordinated sign commitments with their managers and form partnerships with other financial institutions that can use the resources of such funds to complement the guarantee against the credit risk of the financing granted by them.

c) Incorporation

The guarantee facilities may be formed with resources from public or private entities, interested in supporting the development of financing of companies connected to certain sectors. Generally, the guarantee facilities are directed to support financing projects. Examples: FUNPROGER – used for guaranteeing the risk of financing granted by the official federal financial institutions, directly or through other financial institutions, of the financing operations in the scope of the PROGER (initials in Portuguese for Program for the Generation of Work and Income), Urban Sector; FGPC – used for the guarantee of credit risks of the financial institutions in the operations of companies that come to use the lines of financing of BNDES Automatic, FINAME, FINEM and Apoio à Exportação (Support to Exports), FAMPE – used for the risk guarantee of the financing granted by the financial institutions to micro and small companies.

The guarantee facilities are incorporated by law (when formed by public resources, remaining linked to a certain public body defined in the same law) or directly by those private entities which, as mentioned above, are interested in supporting the development of a certain sector (when formed by private resources).

The law, if applicable (when there are public resources), shall establish the main rules of operation of the Guarantee Facility specifically created by it. Notwithstanding the existence of a law establishing the rules of incorporation and operation of the Guarantee Facility, there are always regulations that detail such operation.

The guarantee facilities formed strictly with private resources, in general, also possess regulations of constitution and operation, which are comprised of private legal and operational instruments.

Therefore, each Guarantee Facility possesses its own operation regulation, which shall vary in accordance with the interests of its settler and the objectives of the fund.

As from the approval of the law (as the case may be) and/or its regulation, it is enough to reserve the financial resources for the incorporation of the Guarantee Facility.

d) Administration

The guarantee facilities are managed by administrators, who shall be responsible for all the movement of the resources, especially to honor the debts guaranteed by the fund, in case it is demanded due to default of the borrowers, receipt of the recouped credits from the defaulting borrowers and of the guarantee commissions. For the carrying out of the administration of the guarantee facilities, usually, the managers are remunerated by an administration fee.

"The Guarantee facilities are operated, in the majority of times, directly by the financial institutions which, by powers-of-attorney granted by the fund, guarantee the operations." (citation extracted from the site of CIESP)

e) Commission reverted to the Guarantee Facility

With respect to the guarantee facilities, these are remunerated by commissions for the granting of guarantees, collected by the financial institutions of the credit borrowers and transferred by the former to the managers of the funds, for its proper administration.

The amounts to be collected as commission vary in accordance with each Guarantee Facility.

f) Limits

The guarantee facilities are not granted without limits, that is, there are limits concerning values to guarantee each one of the financings and general guarantee limits. Below are listed the individual guarantee limits, granted by FAMPE, FUNPROGER and FGPC:

- FUNPROGER: Guarantee Facility of the FAT managed by Banco do Brasil, which complements up to 80% of the guarantees required by the bank.
- FAMPE: Guarantee Facility of SEBRAE, which complements up to 50% of the guarantees required by the bank.
- FGPC: Guarantee Facility managed by BNDES, which complements up to 80% of the guarantees required by the bank carrying out the financing via resources granted by BNDES.

As commented, there are general maximum limits to be guaranteed by the guarantee facilities, so that it is assured that all amounts to be due are honored. In the case of FUNPROGER, for example, the maximum value to be guaranteed by FUNPROGER shall be limited to (eleven) times the amount of resources that comprise the assets of the Fund.

With respect to the debts to be honored assumed by the guarantee facilities before the financial institutions at the time of the default by the borrower, there are also limits for the occurrence of such assumption as a result of the default of the borrowers before each financial institution, as shall be explained below.

g) Grace periods and guarantee term limits

In relation to some guarantee facilities, there are Grace periods for its use by the borrower of the financing. There is, also, in some cases, terms for the utilization of the Guarantee Facility, which may be inferior to the contractual financing term.

h) Burdens and guarantees of the Providing Financial institutions

It must be emphasized that the guarantee against credit risk granted to the financial institutions is not total. Both the law of creation of the FUNPROGER (Law No. 9.872, of 23.11.1999) as the law of creation of FGPC (Law No. 9.531, of 10/12/97) expressly set forth that the financial institutions shall participate in the risk of the operations for which the guarantee by such funds is determined.

Still in the case of FUNPROGER, for example, there is a maximum limit of default tolerated, verified per financial institution, to be established by the manager of the fund (in this case o Banco do Brasil S/A), after a hearing with the CODEFAT – of the Ministry of Labor and Employment. The manager cannot exceed this limit of commitment. Besides, the manager shall, also, verify the achievement of the financial agent in the conduction of operations carried out, with respect to the levels of default, delays in the envoy of information to be provided, and other aspects.

As can be seen, the financial institutions that use the guarantee facilities for guarantee of the credit risk of their borrowers operate actively, maintaining control of the rates of default of the loan borrowers and sending reports on such rates to the manager of the respective guarantee facilities, as well as other information that are made necessary (as per agreement to be signed) with respect to the financing contracts, under the penalty of not receiving the resources of the guarantee facilities.

Frequently, it is also determined that the financial institutions demand from the loan borrowers personal guarantees by its controlling stakeholder and/or in rem guarantees, in a manner that the amounts eventually in default, which are honored by the guarantee facilities, can be recouped.

Besides, usually, the financial institutions themselves enforce, extra-judicially our in court, if necessary, the defaulting loan borrowers. This does not mean that the guarantee facilities, when enforced, will not make the resources available to honor the payment of the debts of the borrowers, within the established limits. But a part of all amounts recouped before loan borrowers shall be transferred to the guarantee facilities. In this manner, the resources of the guarantee facilities would be made available as "advanced payment" being returned as they were recouped.

Clearly, the financial institutions assume part of the credit risk by means of the receipt of portions of the recouped amounts. Such portions shall vary in accordance with the assumed risk.

i) Control of the guarantee facilities

With respect to the credibility of guarantee facilities, one must always bear in mind that these are subjected to strict controls, so that it is assured that all payments are honored when their managers are enforced. But, as mentioned above, there are guarantee limits (as a function of the financed amount, of the level of default of the financial institutions etc).

It must also be remembered that the granting of guarantee by means of the Guarantee Facility is preceded by several specific calculations which shall take into account the likely average value of the operations, the average liability of the fund in each operation, the likelihood of credit arrears or defaults. There are, still, predetermined criteria for the granting of guarantees by means of the guarantee facilities.

Therefore, the guarantee facilities are not deliberately used by the financial institutions to guarantee the credit risks of their borrowers.

Still in relation to the credibility of the guarantee facilities, we shall highlight that they are not subject to specific accounting registries, which can be accessed. In case they are guarantee

facilities formed with public resources, the publicity is more guaranteed, because the allocation of public budgetary funds linked to funds shall be made by means of the allocation set forth in the Budget Law or in additional credits. Besides, the destination of public resources of the guarantee facilities shall be submitted to the evaluation of the relevant Public Finance Court.