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# **DEVELOPING FINANCIAL INTERMEDIATION MECHANISMS FOR ENERGY EFFICIENCY PROJECTS IN BRAZIL, CHINA AND INDIA**

## **Workshop on ESCOs and Equity Financing Workshop Summary**

**June 12th, 2005**



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## ABBREVIATIONS AND ACRONYMS

ABEL	Brazilian Association of Leasing Companies
ABESCO	Brazilian Association of Energy Conservation Companies
ASTAE	Asia Alternative Energy Program
BNDES	Brazilian National Bank of Economic and Social Development
BEE	Bureau of Energy Efficiency (India)
CECIC	China Energy Conservation and Investment Company
DFID	Department for International Development (United Kingdom)
EE	Energy Efficiency
EMCA	China Energy Conservation Association
EMC	Energy Management Company (Chinese term for ESCO)
EPC	Energy Performance Contract
ESCO	Energy Service Company
ESMAP	Energy Sector Management Assistance Programme
FEBRABAN	Brazilian Federation of Banks
FI	Financial Institution
GEF	Global Environment Facility
GERBI	Greenhouse Gas Emissions Reduction for Brazilian Industry (Canadian Program)
GDP	Gross Domestic Product
GHG	Greenhouse Gas
Gol	Government of India
IFCI	Industrial Finance Corporation of India
IREDA	Indian Renewable Energy Development Agency Limited
IRR	Internal Rate of Return
I & G	China National Investment & Guarantee Co., Ltd
IDB	Inter-American Development Bank
IPEC	Indian Program for Energy Conservation
M&V	Measurement and verification
NDRC	National Development and Reform Commission (China)
PASA	Pan-American Surety Association
PBOC	People's Bank of China
PCC	Project Cooperation Company
PU	Project Uptech
RMB	Renminbi (Chinese currency)
ROI	Return on Investment

Rs	Rupees
SBI	State Bank of India
SME	Small and Medium Enterprise
SPV	Special Purpose Vehicle
TCE	Metric Tons of Coal Equivalent
TJLP	Long-term Interest Rate (Taxa de Juros de Longo Prazo; Brazil))
TOE	Metric Tons of Oil Equivalent
UNEP	United Nations Environment Program
UNF	United Nations Foundation
URC	United Nations Environment Program Risoe Center on Energy, Climate and Sustainable Development
USAID	U.S. Agency for International Development

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## PREFACE

This report summarizes the issues and discussions from the third of a series of international cross exchange workshops included in the UNF/UNEP/World Bank project “Developing Financial Intermediation Mechanisms for Energy Efficiency Projects in Brazil, China and India.” This third workshop was held at the Holiday Inn in Beijing, China, from April 13 – 15, 2005.

The objective of the full project is to achieve major increases in energy efficiency (EE) investments by domestic financial institutions in Brazil, China and India. The project provides for (a) the establishment of an informal Country Working Group in each country, consisting of representatives from the local financial and EE communities, and provision of support for these groups to complete applied research and analysis on the most pressing operational topics in EE financing, including commercial bank financing of EE, ESCO development, guarantee facilities and equity financing of EE, and (b) a series of focused international cross-exchange activities involving practitioners from the three countries to share experiences and potential solutions to similar problems.

The purpose of this third workshop was to present project experiences and good practices to various ESCO stakeholders in China, Brazil and India, thus allowing for participants to exchange information that may be applicable to the ESCO markets in these three countries. The workshop was focused on sharing information/experiences on two main themes:

- i) The status of equity financing for EE / ESCOs in the three countries and international experiences on equity financing.
- ii) ESCO experiences in subjects of particular interest to the ESCO community (like marketing and contractual models), and exchanges between participants on these subjects.

The workshop also provided an opportunity for the country groups to further develop and then jointly discuss their plans for completion of the project. The main participants were representatives from each Core Country Group, including financial sector representatives, ESCO practitioners, power utility representatives and ESCO association leaders. As one of the main barriers related to the development of the ESCO business in each of these countries is related to the way the concept is presented and adapted to clients, and with the project financing capacities that each ESCO can provide to its potential market, the idea of sharing successes and problems between each ESCO community was thought as a good way to provide new knowledge on how to address these issues. The type of contractual arrangements used, i.e. shared savings or guaranteed savings, and the multitude of ways to adapt them, enabled each of the countries to find new ideas on how to better develop the concept in their own environment.

Over the three days of the workshop, an overview of the ESCO industries in each of the respective countries, as well as of South Korea, was provided, including some ESCO insights on topics such as business models, financing methods and EE project case studies. A presentation of the ESCO market in South Korea was also done. Specific topics were also covered at the request of the organization

group, such as ESCO marketing, the role of power utilities and equity financing for ESCOs. On the concluding day of the workshop, after a short session promoting dialogue between ESCO associations, each team presented their action plans for further development of marketing and equity financing strategies.

The full project is being financed by the United Nations Foundation (UNF) and the World Bank Energy Sector Management Assistance Program (ESMAP), and is jointly implemented by the World Bank and the United Nations Environment Program (UNEP) Risoe Center on Energy, Climate and Sustainable Development (URC).

Pierre Langlois, President of Econoler International, served as the Workshop Facilitator. His responsibilities included the design of the overall workshop agenda, opening and closing of each section of the agenda and working with the core group participants to develop their final action plans.

## INTRODUCTION

Energy Service Companies, or ESCOs (referred to in China as Energy Management Companies, or EMCs\*), are market-based enterprises that identify, develop, implement, maintain and sometimes assume financing responsibilities for energy-saving projects in various sectors. ESCOs operate under the Energy Performance Contracting (EPC) model, which, depending on the specific circumstances, commits the ESCO to the development, implementation, operating, monitoring and verification of savings, as well as of handling various other project-related responsibilities for the benefit of a client. In return, the remuneration of the ESCO is directly linked one way or the other to the energy savings generated by the project. The general rule would be that at the end of the contractual period between the client and the ESCO, the energy end user and final beneficiary of the ESCO project benefit from all of the savings generated by the project. Therefore, upon contract expiration, the client benefits from decreased energy costs and is no longer under any obligation to pay a percentage of savings to the ESCO. Details regarding the length of the agreement, payment mechanisms used by the ESCO (shared savings, upfront payment, etc.), methods used for project financing, strategies to be employed for mitigating risk, ways in which energy savings will be measured and verified, specific implementation model, and a variety of other topics have all to be outlined explicitly in an EPC.

As large developing countries with high energy intensities, noticeable pollution issues and massive potential for saving energy, Brazil, China and India would all benefit from increased activity in the ESCO sector. All three countries have existing ESCO markets and a certain amount of experience when it comes to the abovementioned concepts and business models, yet improvement is needed in a variety of areas if the ESCO model is to be fully utilized and brings about the maximum amount of benefit for these countries. As representatives of the Brazilian, Chinese, and Indian ESCO markets all hail from countries with comparably large land area, enormous populations and similar levels of economic and social development, the ESCO markets in all three countries stand to benefit greatly from increased dialogue and inter-country information exchange.

With this in mind, this workshop on equity financing and other ESCO-specific topics was convened in Beijing, China, to address the concerns of ESCO practitioners and stakeholders from all three countries, thus providing a forum for each country to exchange information on ESCO operations. It is hoped that through these exchanges, ESCO stakeholders from each country will be able to assimilate the successful practices of other nations into their own ESCO operation strategies, thus allowing for faster, better-rounded development in the Brazilian, Indian and Chinese ESCO markets. Topics covered at the workshop included background information, business models, marketing strategies, equity financing, measurement and verification (M&V) of energy savings, as well as the needs and the role of national ESCO associations.

\* will only be referred as ESCO in the present document

## 1 COUNTRY REPORTS: THE STATUS OF THE ESCO INDUSTRY

This section summarizes the presentations given by each country team on the actual overall development and status of the ESCO industries in each of their respective countries. Each presentation can be downloaded from the Web site: <http://3countryee.org/intra/> Emphasis has been placed on the development of the industry as a whole, the current situation regarding ESCO development as well as the number, type and specialty of active ESCOs in each country.

### 1.1 Brazil

#### 1.1.1 Development of the ESCO Industry

Brazil has forty million people living below the poverty line, and promoting the efficient use of resources is an important way to reverse this trend. With this in mind, the Brazilian government has begun taking some specific actions to emphasize the need for EE improvements, and the public sector is starting to respond. This rising awareness regarding energy efficiency, when coupled with an ever-increasing concern for the environment among everyday Brazilians, is having a positive impact on the growth of the Brazilian ESCO industry. However, as many people continue to see EE as a circumstantial issue (i.e. they perceive EE measures as making sense only if energy resources are particularly scarce), they tend to overlook the inherent value of EE methods. This tendency undoubtedly presents a challenge for the Brazilian ESCO market.

In addition to the reasons noted above regarding increased social awareness, growth in the ESCO industry can also be attributed to specific governmental action. For instance, the Brazilian government mandated that power utilities devote 1% of their annual revenues (totaling around \$100 million USD) to EE causes. This has become a major driving force behind growth in Brazil's ESCO industry, and has resulted in various R&D activities and educational programs. Increased tariffs for new energy bids and a growing worry among public bodies to optimize energy costs are also pushing the government to emphasize EE measures.

Additionally, the presence of various organizations and programs—many international in scope—have made significant contributions to growth in the Brazilian ESCO industry. These have included a WINROCK/USAID program, programs through the World Bank and PROCEL (a nationwide electricity conservation program that funds the EE endeavors of various public and private institutions), cooperation from a number of financial institutions and the involvement of international ESCO associations in Brazil's ESCO field. Obviously, Brazil's own ESCO association, the Association of Brazilian Energy Service Companies (ABESCO), is also active in promoting ESCO development. In its cooperation with the World Bank and PROCEL, ABESCO is undertaking a vigorous training campaign designed

for ESCO capacity building and certification. Developing protocols for monitoring and verification (M&V) and constructing an ESCO database are also on the agenda for ABESCO.

In Brazil, it was presented that 90% of all ESCO projects are funded through power utilities (this information has to be qualified, as it is not clear if this figure was only for ABESCO members or for all ESCOs in Brazil) the majority of which are privately controlled. This utility-based investment is largely in response to a government policy mandating that Brazilian power utilities devote a small percentage of their revenues to EE-related activities. In addition to the official program supervised by ANEEL, however, other models of utility-based investment in the ESCO sector have arisen without the direct sponsorship of the government. This immediately raises a question of conflicting interests: voluntary investment in EE on the part of electricity suppliers does not make sense on the face of things, because in making EE investments, utilities would be damaging their own profits by reducing the public's demand for electricity. Faced with this contradiction, it only makes sense for utilities to invest in those EE projects that advance their own self interest, such as projects aimed at peak-shaving (which doesn't actually reduce demand) or projects that develop new customers. Utilities will not voluntarily make self-destructive investments.

On the financial front, a number of options are being explored for ESCO project financing development. One is the possible establishment of a guarantee fund; the model for such a fund is currently in the development stages, with support from the "Three country energy efficiency project". Another is an investment fund or holding company that is specifically devoted to funding Brazilian ESCOs (perhaps through PROCEL/MME/BNDES).

### **1.1.2 Current Status of the ESCO Industry<sup>1</sup>**

Currently there are 72 active ESCOs operating throughout Brazil. Most of these are based in the south or southeast, which are the most developed, industrialized and populated regions in Brazil, but ESCOs can be found in other areas as well. A large majority of these companies are quite small in size, with annual revenues of around R\$150,000 (rarely higher than R\$500,000) and up to 5 or 10 employees. Those ESCOs with higher revenues generally gain a significant portion of this money through non-EE activities and other more traditional projects. Some international groups have undertaken actions in terms of EE, but there are very few in comparison to the overall market potential. Brazilian ESCOs are open for this type of international cooperation, indeed some are extremely prepared for it. They're small, but very ready. ABESCO is a good intermediary through which to explore this type of cooperation.

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<sup>1</sup> The data in this section are based on a survey of the ESCO industry, carried out by ABESCO among its members in January 2005, and analyzed by Alan Poole.

Brazilian ESCOs typically operate in the commercial and industrial sectors, with less attention given to the public or institutional sectors (this despite the fact that a recent survey of 700 public buildings found an average of 42% energy savings to be found in public buildings). The best prospects for ESCO development are found in the commercial sector (i.e. in supermarkets, commercial buildings or shopping centers) as customers in this sector operate at high energy rates. Regardless of sector, Brazilian ESCO projects are generally quite small in size and can deal with any number of EE measures, including increasing the efficiency of electricity or water usage, implementing DSM projects and installing cogeneration facilities. It is important to note, however, that because of heavy funding from power utilities (as mentioned above) around 90% of Brazilian ESCO projects are conducted in cooperation with these utilities.

Brazilian ESCOs have been growing steadily for the past several years, with increases in business volume ranging from 20% to 200% in some cases. This tremendous growth of some of these ESCOs was mainly due to favorable circumstances when it came to project financing capacity, as these ESCOs had access to the power utilities and to the financial market.

All together, the market potential for Brazilian ESCOs represents around \$1 billion annually, with the largest of all ESCOs claiming US\$5 million in revenue each year.

ABESCO has been playing an interesting role in the development of this early ESCO market, through direct and indirect support from the government. An example of indirect work is when the government makes pro-EE regulatory changes, spends money, and therefore promotes the growth of both ABESCO and the ESCO industry as a whole. For instance, the Brazilian government is currently in the process of passing a law for a private-public partnership project (PPP project), which will allow ESCOs to invest in the public sector. The PPP project will be one of the major ways to leverage businesses in the public sector. Such a program indirectly benefits ABESCO. There are also several more direct ways for the government to work with ABESCO. These take the form of a variety of programs.

In order to protect its member and the quality of the ESCO business, ABESCO is currently trying to develop a qualification/certification process for ESCOs. This is happening on two fronts: the first involves capacity building and training. Several certification trainings have been designed for ESCOs, and hopefully they will be completed in September. Second, ABESCO developed regulations on the qualification process; they are similar to ISO9000, but specifically designed for Brazilian ESCOs. Once the trainings will be completed, hopefully the certification process will begin. One of the main ABESCO concerns on this qualification/certification process is that since most Brazilian ESCOs are small, they may not be able to cover the cost of certification.

## 1.2 China

### 1.2.1 Development of the ESCO Industry

The birth of the Chinese ESCO industry can be attributed to the work of an ongoing World Bank/GEF project that began in 1998. The first phase of the project established three pilot ESCOs (or EMCs as they are referred to in China) and gave them the resources required for implementing EE projects through the energy performance contracting model. The success of these three companies proved indisputably that the EMC concept is workable in China, and paved the way for the second phase of the project, which aimed to establish an EMC association and set up a guarantee fund for EMC finance. Thanks to promotion from the government, support from phases I and II of the World Bank/GEF project and financial contributions from the UK's Department for International Development (DFID), thousands of people have been trained in the EMC concept and a host of new EMCs have been developed.

China's EMC association, "EMCA", was formally established in April, 2004. Association membership is currently made up of 58% EMCs and 42% various other organizations, such as equipment suppliers, financial institutions, law firms and energy efficiency centers. The overarching task of EMCA is to promote the sustainability and growth of China's EMC industry, which it accomplishes by providing trainings, consultations and a variety of other services to association members. These include organizing large-scale activities, maintaining a website, researching case studies and disseminating a newsletter.

Development in China's EMC industry is also encouraged through a commercial loan guarantee fund. After over a year in operation, several Chinese EMCs have made use of the fund to acquire commercial loans and implement EE projects. As in other countries where the ESCO concept is unfamiliar, skepticism on the part of customers, and indeed society as a whole, is a key concern for Chinese EMCs as they seek to develop their businesses.

### 1.2.2 Current Status of the ESCO Industry

There are currently over 60 EMCs among the members of EMCA (possibly as high as 80 depending on the definition of "EMC"), with Beijing and Shanghai as regional hotspots. Indeed, 40% of EMCA's membership is located within the Beijing municipality alone. Despite this high concentration of EMCs in Beijing, there remains a relatively wide EMC distribution throughout the country. Most Chinese provinces, with the exception of places like Tibet, Qinghai and some other remote and/or underdeveloped areas, have at least one EMC. As is the case in Brazil, most of these companies are relatively small, with the majority of EMCs having between \$35,000 and \$600,000 USD in registered capital. There

are, however, a few significantly larger EMCs that have enjoyed particularly fast growth in recent years.

With regard to priority sectors and project types, Chinese EMCs tend to focus their activities on commercial and industrial clients. This was borne out in a recent EMCA survey of 133 projects, which found that central air conditioning retrofits represent the most common type of project among Chinese EMCs (with 38 projects), and EE improvements on industrial processes are also quite common (with 20 projects). Other frequently implemented projects include variable speed drive projects (19), heating and cooling projects (14) and waste heat recovery projects (11). Most of these projects require less than \$300,000 USD in investment, but some may go as high as several million USD, with the largest project involving over \$9 million USD in investment.

Chinese EMCs operate using various types of business models, but the “shared savings” approach is by far the most common. The “guaranteed savings” method is beginning to gain some steam in China, however, and the so-called “energy cost contracting” model (similar to a chauffage approach) is also in use in some areas. These strategies have led to steady growth throughout the EMC industry.

Typical Chinese EMCs are represented by a few main categories, as outlined below:

- The Liaoning EMC: As one of the initial three pilot projects under the World Bank/GEF project, this company has begun cooperating with research institutes to develop new technologies. Like the other two pilot companies, it has realized steady growth. The company has also been very effective at setting up a nationwide network of EMC partnerships.
- EMCs with buildings as the main market
  - PowerU: As an EMC with its own cold storage technology, this EMC has experience with various financing methods. These include equity financing, project financing and commercial loans with guarantees.
  - Huitong Huacheng EMC: This company has developed its own software for controlling central air conditioning systems, and has projects all over China.
- EMCs with the industrial sector as the main market
  - The Shenwu EMC: With its own boiler technology for use in the industrial sector, this company has implemented over 100 retrofit projects and is one of the fastest growing and largest EMCs in EMCA.
  - The Hubei Sanhuan EMC: This company has its own high-voltage variable speed drive technology for use in various sectors, and makes use of its own software for savings verification.
  - Dongying Shengdong Machinery Company: This enterprise specializes in cogeneration and installing power stations to make use of various types of waste gasses, and has captured 60% of the market for these projects.

- EMCs using the energy cost contract model
  - Shenzhen City Zhongcai Energy Management Co: Customers for this EMC include hotels, supermarkets and restaurants. In the energy cost contract model the EMC guarantees that the customer's energy bill will be reduced and then energy fees are paid to the EMC to cover management.

## 1.3 India

### 1.3.1 Development of the ESCO Industry

In India, as in other countries, high energy costs and high energy intensity are driving increased demand for an ESCO industry. This, when coupled with increased international competition and ESCO-specific action on the part of the government (such as a 30% savings target in public buildings), has led to growth in India's ESCO sector.

The development timeline for India's ESCO industry effectively began in 1992, when an ESCO feasibility study funded through USAID began. Between 1992 and 1996, various programs funded through this and other organizations brought about feasibility studies, grants for ESCO promotion and the formation of a few ESCOs. The years between 1999 and 2001 saw the passage of an energy conservation act, the startup of the ECO-I and ECO-II projects (which facilitated ESCO formation and focused on best-practice DSM projects), and the extension of a \$5 million USD GEF grant under a \$130 million line of credit from the World Bank to IREDA, a public financial institution. These funds were used for supporting ESCO market development, building the capacity of ESCO stakeholders, developing cluster projects in various sectors, and producing sector-specific investor manuals for EE in small and medium-sized enterprises.

In terms of financing ESCO growth, banks are becoming more involved in ESCOs and the EE industry. Three banks that are members of the Indian Core Group have developed EE-specific financing schemes, and dialogues between banking institutions and ESCOs have already initiated; this is despite a general reluctance among banks to move away from traditional, asset-based lending. These three banks are all longstanding banks that have come up with three different EE financing schemes. The State Bank of India, for instance, developed its scheme in 2002. A guarantee fund may act to ease banks' tensions in this respect and open up new sectors (such as municipal EE projects) to ESCO activity. Other financing schemes, such as incorporating carbon credits through the Kyoto Protocol or appealing to venture capital investors are also being explored. Other alternatives such as Venture Capital (VC) Funds have very limited presence at this time in India. But the India team feels that VC funds are very important to the future of the ESCO industry, and this alternative should be investigated more in the future.

Finally, the government is playing a role in developing the ESCO industry. As mentioned previously, an Energy Conservation Act was passed in 2001. This act mandated the formation of the Bureau of Energy Efficiency (BEE), a government body that, through creating EE standards, product labeling, building codes, and accrediting energy auditors, has benefited the ESCO industry in a real way. More directly, the BEE has enlisted the ESCOs for undertaking the energy efficiency programme in government buildings. The Central government made a commitment to reduce energy consumption by 30 percent in government's buildings and establishments. Steps were initiated to implement energy efficiency projects through the ESCO route in select public buildings.

### **1.3.2 Current Status of the ESCO Industry**

There are fewer ESCOs in India than there are in Brazil or China, with only around 20 active companies. Similar to China and Brazil, however, most of these companies are small in size, with weak asset bases and project transaction sizes generally ranging from \$100,000 USD to \$1.1 million. Indian ESCOs are generally either consulting or service based or vendor-based ones. Many of the EE consultants and energy auditors are now graduating into the ESCO business.

India's ESCO market can be divided into three promising areas. These are: EE projects in small and medium-sized enterprises (SMEs), EE projects in buildings (like hospitals, shopping centers, etc), and DSM projects in cooperation with utilities. Of these, projects in buildings and SMEs seem to be an excellent fit—though increased awareness and benchmarking techniques are needed in some industries. The potential for DSM projects exists as well, and more incentives to promote DSM would go a long way toward encouraging ESCO activity in this field. ESCO projects in large industries are not particularly feasible because of these enterprises' ability to implement EE measures on their own. Because of political sensitivity, projects in the agricultural sector are also difficult to implement through an ESCO format.

As outlined above, project transaction sizes for Indian ESCOs range from \$100,000 USD to \$1.1 million. Two year payback is the norm, and most projects are conducted using the guaranteed savings business model. Indian ESCOs report a broad range of projects in a wide range of customer categories, including private industry (heat recovery, fuel switching, process upgrades, lighting), commercial and government buildings (HVAC, lighting, controls) and power utilities or municipalities (capacitors, water pumping, street lighting).

## 1.4 South Korea

In part of the workshop, a special presentation on the development of the ESCO market in South Korea has been made.

In Korea, for the purpose of intentional promotion of energy savings investment, the government is currently supporting the ESCO business by providing relatively lower interest rate funds. This provides an important incentive for the development of the market. Unfortunately, even with this government support, the ESCO market still needs new ways to finance the project through the market. Most of the ESCO businesses in South Korea are small & medium size and have serious problems in finance due to low credit ratings. The ESCO generally acts as project developer for a wide range of diagnosis of energy savings and following facility installments. But it also assumes the technical and performance risk associated with the project. In order to earn investment revenue, ESCO bears the investment risk. The basic form of EPC between the ESCO and the final user is the shared savings one.

In order to support the development of the ESCO market, the government promoted some new policies mainly focusing on promoting the creation of energy savings system, improving and strengthening of institution/policy in energy savings.

The types of projects that are the focus of the industry at this time are:

- Lighting
- Cogeneration
- Boiler
- Process improvement
- Heat recovery steam generators
- Air cooler and heating system
- Power, kiln & furnace, operating funds, etc.

The ESCO industry is addressing many important issues at this time:

- Investment on energy savings has not been considered economically feasible projects due to low energy prices controlled by government in Korea.
- Small ESCO businesses lack diagnostic expertise and provide unreliable measurement of resulting energy savings.
- Lack of access to financing and credit; ESCO has limited capital. The more ESCO projects performed, the higher the debt ratio for ESCO.
- Private fund should be mobilized promoted to ESCO investment since at the present time, Korean ESCO relies on government funds.
- ESCO could be a very practical and useful way to prepare the Kyoto Mechanisms - Kyoto Protocol has come into effect in February 2005.

## 2 ESCO INSIGHTS, SPECIFIC BUSINESS TOPICS

In implementing EPC projects, ESCOs around the world use a variety of different approaches that can be all brought back to some general types of approaches. The two most common ones in the three targeted countries of this project are the “Shared Savings” model and the “Guaranteed Savings” model, even though there is a third model called the «Chauffage» model that does not seem too popular at this time in neither countries.

In order to reflect the content of presentations delivered at the Beijing workshop, this section is divided into four distinct parts:

- The first is “ESCO business models”, which touches on contract designs, financing methods and interesting innovative approaches presented.
- The second section is focused specifically on each country’s experiences with ESCO marketing strategies.
- Next, a section is devoted to exploring the prospects for equity financing in the ESCO industry.
- The final section covers a special section on exchanges between the Brazilian and Chinese ESCO associations, and the need and roles of such association. Note here that nothing on India can be reported as there is no current ESCO association in the country at this time.

### 2.1 Business Models used in Brazil, China and India

#### 2.1.1 General Concepts

As the following concept has been dealt with in great length during the workshop, it is interesting to start by including a short presentation of the two main ESCO model families used in each country:

##### *The Shared Savings Model*

Under a shared savings approach, the client and the ESCO use an agreed upon ratio (which is stipulated in the contract) and, quite literally, share the savings that result from project implementation. In this case, the ESCO generally undertakes the credit risk for the project (i.e. the ESCO provides the financing through its own equity or a loan mechanism), which makes the shared savings approach relatively easy to “sell” to clients. Yet using the shared savings approach can be a limiting factor for most ESCOs—especially small ESCOs—because banks may be unwilling to lend to ESCOs that have high debt ratios and/or unacceptably low registered capital. As the ESCO contracts itself and its associated conditional receivables are difficult for banks to recognize as an asset, the debt/equity ratio rises dramatically for each project where debt is obtained by the ESCO, limiting tremendously its growth capacity.

### ***The Guaranteed Savings Model***

Under a **Guaranteed Savings** approach, an ESCO would take all the same responsibilities as in the shared savings model, except the project financing will be on the balance sheet of the client. If the energy savings from the project are not enough to fully cover the client's debt service obligations, the ESCO is charged with covering the difference. On the other hand, if the project is successful and savings exceed the guaranteed threshold for loan repayment, the excess savings are often shared between the client and the ESCO according to an agreed upon ratio.

#### **2.1.2 Particularities of Each Country**

In most countries, the shared savings model has been used the most. In China for example, this is the model that is used the most, as it was the main one introduced by the three pilot EMC World Bank projects. In this case however, the savings were mainly assumed, as it does not seem to be the case in the other ones.

In all the three countries, the guaranteed savings model does seem to be used relatively infrequently, but there are some examples of projects in Brazil and China. It appears that the guaranteed savings model is best used in countries with advanced banking systems and some familiarity with project financing, so this may be a reason for the model's relative under use—especially in China. In India, the guaranteed savings model is used perhaps more frequently than in the other two countries (but still not nearly as frequently as in more mature ESCO markets). The guaranteed savings approach requires that the client acknowledges the project's inherent value, and as ESCOs are new in these countries, this can be difficult—so the approach is used less frequently.

Furthermore, on top of these particularities, some of the three countries analyzed presented some interesting, different applications of these models that are worth presenting:

#### ***Brazil***

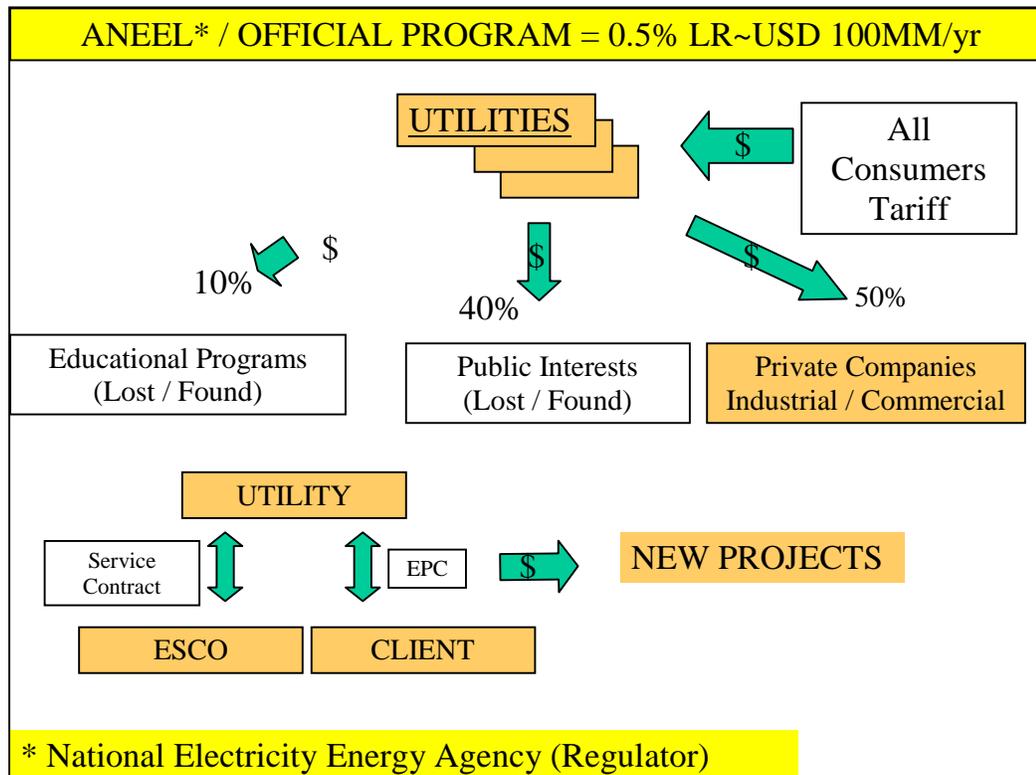
There are essentially three different types of ESCO business approaches in Brazil, the first two being the conventional shared savings and guaranteed savings ones. The shared savings model is the most used, and involves mainly relatively small-sized industrial or commercial clients, as well as in the public sector, but difficulties with public-private contracting are a limitation here. Efforts that lead to the development of Public-Private Partnerships (PPPs) may be a solution to this problem, as the Brazilian government is acting in concert with local (state) governments to get such PPPs established in the ESCO industry. It is to be noted that some «assumed savings» arrangement are also used in this context.

Two other approaches, very specific to the Brazilian market, have also been developed and used in the ESCO market that proved innovative and interesting for other markets.

- i) Ever since 1981, when the Brazilian government initiated a nationwide program designed to save oil, the national government has been using various rulings to mandate that power utilities invest revenues in EE measures. During the phase of privatization of much of Brazil's state-owned power utilities, the most relevant such ruling took place in 1998, when Brazil's national power sector regulator (ANEEL) mandated that privatized power utilities invest 1% of net operational revenues in EE measures. This ruling was clarified in 2000, when law 9991/2000 stipulated that 0.5% of net operational revenue was to be spent on technical or R&D measures for EE (administered through the National Fund of Scientific and Economic Development), and another 0.5% of revenue be directly placed into demand-side EE programs of utilities. Under the above law, utilities are required to present their annual energy efficiency expenditure programs to ANEEL for approval. ANEEL has developed a manual for helping industries do this. When ANEEL's regulation was passed in 1998, 17 utilities were affected—but now there are 40.

ESCOs found an important niche in playing a fundamental role in executing energy efficiency projects with investment from utilities under the above law. They are charged with prospecting for customers, developing feasible projects, setting EE targets, taking on a marginal level of risk (in some cases), actually executing the EE project and conducting M&V procedures. Typically, the ESCO will seek out a customer, design a project, present it to the utility, and then sign a service contract with the utility for the project implementation. Under this arrangement, the ESCO is paid based on a fixed fee arrangement—not based on actual savings over time. On the other hand, in the event that the agreed upon savings evaluated in the ESCO audits are not met by the project, 10% of their service charge is withheld from the utility as a penalty, bringing the necessary savings related payments to the ESCO work so this qualifies as a EPC.

The following graph (presented in the following page) has been presented by Brazilian utilities representatives to demonstrate the concept:



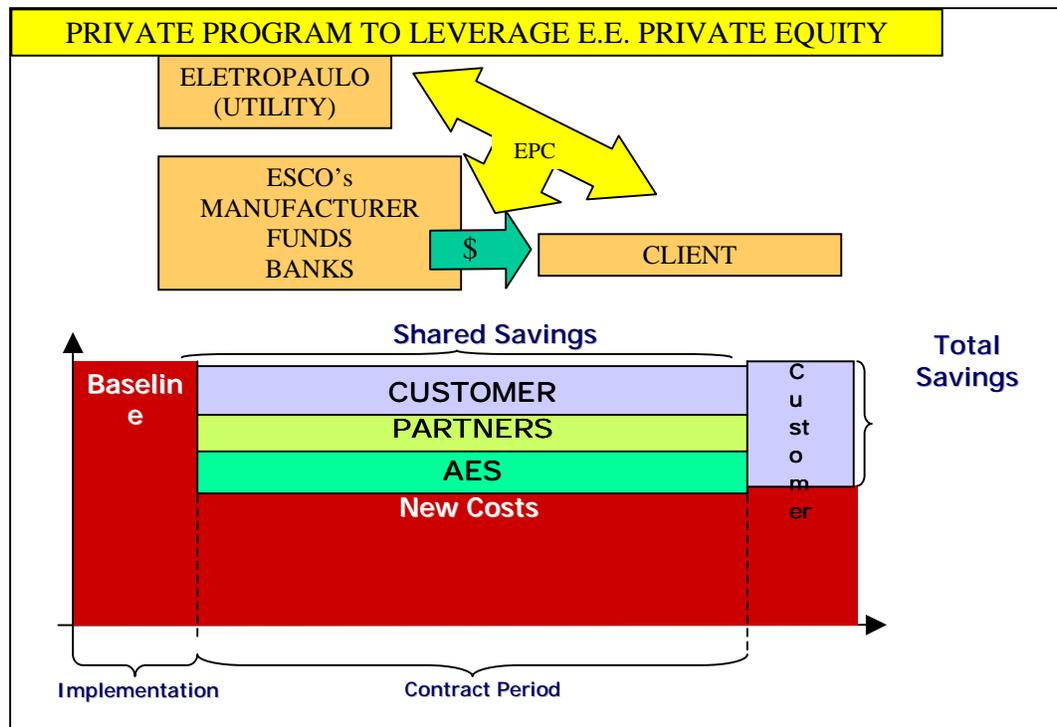
It is important to note, that even though this approach seems to be very interesting to develop the ESCO market, many barriers were presented that would tend to limit the sustainability of such an approach in the long term:

- Investments tend to be focused on sectors with relatively low potential for saving energy (public lighting only represents 3% of total consumption in Brazil, for instance), but proves attractive to utilities for other reasons
- The utilities are still perceiving the approach as a «Loss of revenue» one and the likelihood of them abandoning such an approach is high if the ANEEL regulation would come to disappear
- Project size: many of these projects are small in size and have low return, which would not make them viable if the ANEEL regulation would not be there to stimulate the utilities to undertake them.

ii) Another, non-governmental model for utility participation has emerged recently, which is more flexible and acts to supplement the ANEEL program. In this model, the utility signs a three-party contract that involves investment/implementation partners, a client, and the utility itself. Investment partners can include ESCOs, various funds, banks and/or manufacturers. There is no single model for conducting projects under this scheme, and many different institutions can participate. For instance, a bank may

finance the project directly—perhaps taking equity in the project itself—or it may finance the participation of an ESCO or manufacturer. If the bank participates through one of these partners, it will be paid through whichever partner has benefited from bank financing.

The following graph has been presented by Brazilian delegation to demonstrate the



concept:

### India

The Indian market also has some particularities that are interesting to point out on a market development approach. DSM seems to have been an important trigger for ESCO project development, which does not seem to be the case in the other countries. Even though this scheme has been used mainly for street lighting projects so far, it seems quite promising in the development of the ESCO concept in the country.

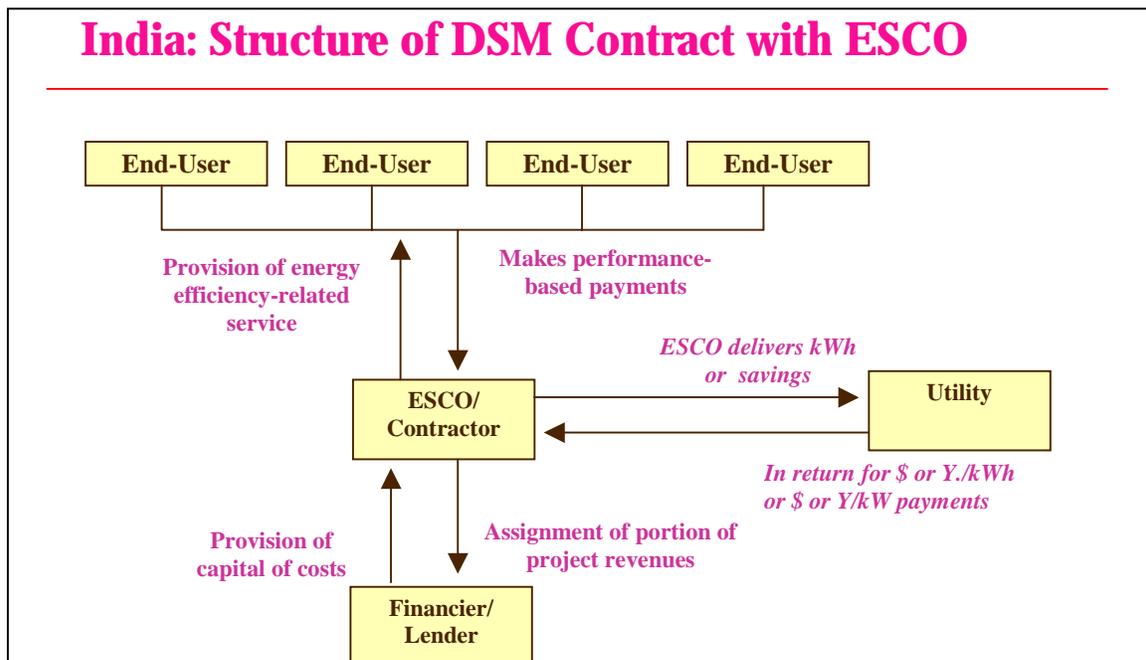
Two specific approaches were also presented during the workshop that provided interesting new models that could be considered in other countries`:

- i) In this model, the ESCO enters into an agreement with the utility covering the performance and selection of equipment. Then there is a direct agreement between the bank and the vendor (or ESCO) for getting the ESCO a line of credit. With

financing secured, the ESCO then approaches each individual customer, tells each customer of the equipment to be installed (capacitors), and convinces the customer to pay in fixed installments. The client is happy to do this, because if it does not, it cannot save money through using the equipment. If the capacitors do not work, the ESCO has to pay a penalty, which is deducted by the utility. So the consumer is protected from penalties while the ESCO guarantees the performance. So as long as equipment is working, the customer agrees to pay the utility company. The utility company collects money monthly from all these customers, and pays the ESCO after deducting a fixed collection charge (8%), which is agreed upon by the ESCO and utility beforehand. The ESCO uses only one invoice in this setup.

The utility cannot disconnect the consumer if payments are not made (unless the customer does not pay the electricity bill). So the ESCO shoulders that risk. If a customer does not pay, there is no legal recourse except court. So in the end, the utility makes collection only when the customer pays the utility.

The following schematic presents how the project is structured:

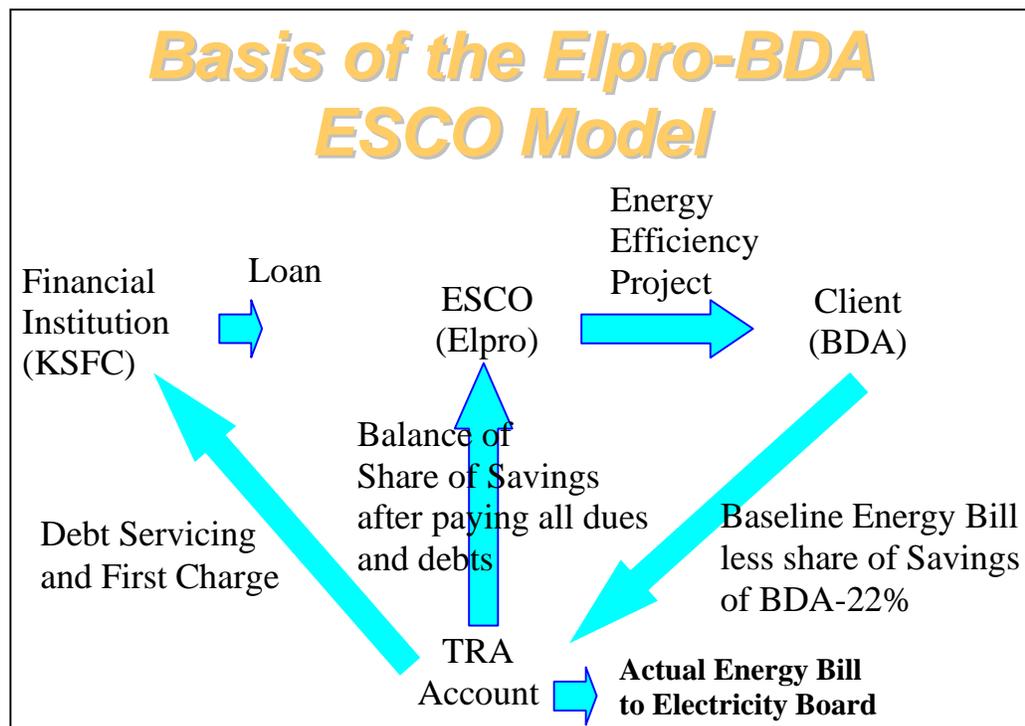


An interesting note about this model is that ESCOs are also conducting ongoing DSM projects with private utility companies, even though these utilities are in the business of selling electricity, not EE (which differs from public utilities which are constantly in lack of capacities). In this context, EE may seem to be against their business. However, for every dollar saved by the consumer through these DSM projects, the utility ended up saving three dollars, mainly due to bad power factor from the targeted

consumers. Due to this specific case, the utility ends up saving money despite decreased revenues.

- ii) In this model focusing on municipality projects, the ESCO starts by taking out a loan from a bank, and guarantees that its municipal lighting project will realize about 25% savings; 22% of these savings are guaranteed to the client up front. The ESCO then proceeds to implement the project. A key step in this model is that the client who pays the electricity bill for the city, pays the bill into a special “trust and retention account”—or TRA—instead of directly to the electricity board. The amount paid into this account by the client is its baseline electricity bill minus its guaranteed share of the savings: 22%. The money that accumulates in the TRA account is then used to pay the actual electricity bill and repay the project loan. Any funds that are left over in the TRA account after paying electricity bills and loan debts is taken by the ESCO. The contract can be anywhere from four to seven years in length.

The following diagram presents the business model applied through this approach:



This model offers a number of comforts and guarantees to both the client and the financial institution. For the financial institution, any incentives, grants or carbon money arising thanks to project activities are placed in a debt service reserves account (DSRA), which acts as a guarantee for the project as a whole. Another reassurance to the financial institution is an irrevocable letter from the client and a

guarantee of payment from the ESCO. Banks are, on the whole, very comfortable with this model.

For clients, the ESCO contract itself offers a certain amount of reassurance. In it, 25% energy savings are guaranteed, an exit clause is spelled out, and there is an “event of default” clause also built in.

### ***Business Model Summary***

Even though each country that took part in the workshop presented many different Business models for ESCO projects, most of them basically just came back to a slight variation of shared savings or guaranteed savings approach.

On the other hand, some of these models involved more heavily in one way or the other utilities in relation with either government directives or pure commercial instincts related to the benefits of DSM projects.

Lessons learned by these models are mainly focusing on the concept that the ESCO model is not a static one and that it can evolve to adapt to the specific institutional and market conditions of specific countries. Innovation is certainly one of the key to success, and some of the ESCOs that presented their models demonstrated this concept pretty well.

## **2.2 ESCO Marketing Strategies**

It is a known fact that clients seldom look for organizations to help them develop and implement EE projects. ESCOs have to develop actively their market if they are going to be successful. Clients mistrust, disbelief and/or unwillingness to implement ESCO projects can be one of the main barriers for the development of a sustainable ESCO market.

This section of the workshop addressed this particular issue and tried to provide practical solutions to ESCO operators based on the success demonstrated in each country.

### **2.2.1 Brief Overview of the Situation in Each Country**

#### ***Brazil***

As power utilities are the main forces driving activity in the Brazilian EE and ESCO sectors, nearly all ESCO-related issues—including ESCO marketing—cannot be divorced from a discussion on the role of these utilities in business operations. With this in mind, the below analysis of ESCO marketing strategies in Brazil begins with a summary of the influence of utilities on Brazilian ESCO marketing.

- **The influence of utilities**

As mentioned in section 1, 90% of all Brazilian ESCO projects are funded through power utilities. This, of course, influences greatly the marketing approaches taken by ESCO in Brazil. Since investment is ultimately coming from power utilities, and as these utilities likely have a specific set of projects in mind when making EE investments, ESCOs are more than encouraged into marketing their services toward less than ideal clients for them in a regular market. In other words, ESCOs may develop relationships with clients based not on energy saving potential, but based instead on each particular client's ability to satisfy power suppliers' goals. This also explains why ESCOs concentrate on projects designed to save electricity rather than fuels.

Regardless of their motives, the influential presence of power utilities in Brazil's ESCO market, in addition to the simple fact that no company—utility or otherwise—will make self-destructive investments, is bound to complicate marketing decisions for Brazilian ESCOs. Indeed, when ESCOs first paired with power utilities in this manner and approached clients for implementing EE projects, they were often seen as “spies” for the power companies. Generally speaking, though, Brazilian power utilities are trusted and seen as reliable partners—which is not necessarily the case in many other areas of the world—so teaming up with power utilities is not overly damaging to an ESCO's reputation and is creating a good source of initial project pipeline at this early development time of the ESCO concept in the country.

- **ESCO marketing challenges and solutions**

Brazilian ESCOs cite client mistrust as one of the key marketing challenges facing ESCOs today. This mirrors the experience of ESCO markets in the developed world, and is characterized by the persistence of a “too good to be true” mentality among clients. As in Canada in the eighties, Brazilian ESCOs are having a difficult time convincing clients of the quality and trustworthiness of this new approach. ESCO customers continue to believe that only lighting experts can fix lights, and only air conditioner experts can make improvements to air conditioners. They find it hard to believe that *one company* can reliably provide all of these services and deliver energy savings. In short, Brazilians see the ESCO concept as dishonest, and this perception will take time to overcome. One approach that seems to have worked is creating partnerships with equipment distributors. This brings a certain level of credibility to the ESCO, and helps the client get over their initial skepticism.

Another common marketing problem facing Brazilian ESCOs is the tendency of clients to implement projects themselves after ESCOs have alerted them to the presence of energy savings potential. In such cases, the client generally feels that it has the expertise to carry

out the project on its own. Regardless of whether or not this is true (it is often not), the perceived feasibility of self-reliance often leads to lost opportunities for ESCOs.

### **China**

The marketing strategies of different EMCs are varied, with each company making use of different means for finding, convincing, and then signing contracts with clients. It is difficult to provide a general view of the approach taken in the country in regards to ESCO marketing approach as it is quite diverse.

One of the most successful approaches presented was the one of the Shandong Province Energy Conservation Engineering Co. This company, one of the three pilot EMCs established under the World Bank/GEF project, has accumulated a significant amount of experience with regard to marketing and developing projects (the company—referred to simply as the Shandong EMC—has completed a total of 79 projects of various sizes in many industrial sectors). Notably, not one of this company's projects has failed, and all payments have been collected as scheduled.

To gain access to business opportunities and achieve the above successes, the Shandong EMC has used an elaborate marketing and client-screening process. This process generally begins by scanning the members of sector-specific industrial associations (each industrial sector has its own association in China—and membership can be quite large). Such activities can link the EMC up not only with potential customers, but also with relevant energy saving technologies that might be useful for implementing EE projects in cooperation with industrial enterprises.

Another useful way to develop clients and tap new business opportunities was to emphasize the way in which the EMC benefits society. The Shandong EMC, as a fairly visible pilot company, has had several business opportunities present themselves automatically—without any effort on the EMC's part—thanks to the fact that the EMC is well known as being beneficial to society as a whole.

As it was mentioned by most China organizations present in the workshop, it appears that the importance for EMCs to have their own technology is of great importance on a marketing point of view. The EMC should use its own technologies, and if this is not possible, it should at least use a type of technology that is not easily copied by others.

## **India**

In India, the key marketing challenge seems related to the fact that the ESCO concept is new and unfamiliar. Indians are not new to EE initiatives—indeed centrally funded EE initiatives have been in operation for three decades—but market-based approaches like the ones used by ESCOs are still quite unfamiliar. This situation persists despite high oil prices and high energy intensity, both of which should act to increase the public's demand for market-based EE measures. So, importantly, a society-wide change of mindset would help ESCOs in their marketing endeavors. As it is however, the challenge for ESCOs at this time is related to *selling the concept* to a relatively unresponsive audience.

Some specific barriers to marketing ESCOs in India were presented outlined:

- Low awareness/misconceptions: customers want to know “where's the catch?” and equipment suppliers often misperceive ESCOs as somehow being able to “gold plate” projects. Bankers remain skeptical about the ESCO concept in general, and are unwilling to shift from asset based lending in favour of cash flow based lending.
- There is a need for baseline data and benchmarks (especially for SMEs in building industry, casting industry, etc). The three country project made an investor handbook; perhaps something like this could be designed for benchmarking activities.
- Further energy price rationalization is needed (especially in agriculture).
- More ESCO success stories are needed. This would give ESCOs more credibility as they attempt to convince clients of the model's quality.
- Also, there is no culture for continuous M&V in India. A “fix it and forget it” attitude persists.

### **2.2.2 Marketing Process Issues**

One of the most important sessions of the workshop was related to a long exchange and debate on marketing models used by the different ESCOs in the three countries. Bob Taylor of the World Bank initiated this discussion with a summary of the five different kinds of ESCO marketing approaches that he believed are being used in the three countries, based on the earlier presented that has been made by the different speakers.

The five types of ESCO marketing approaches in Brazil, China and India can be summarized as follows:

- i) The first model of ESCO marketing approach is based on the supply of financing and various technologies by the ESCO. ESCOs that use this approach are paid a certain amount based on the actual savings realized by the project. There are many different types of projects relevant here, but the key to this approach is financing. In many ways, the ESCO is like a bank in this model—so a lot of time is spent on ensuring repayment. Rate of returns are generally around 20% for these ESCOs, but the ESCO needs a lot

of money of its own (because it is financing the projects). China's Shandong pilot EMC is a good example.

- ii) The second model of marketing method is used by ESCOs that offer specific technical solutions. Oftentimes these ESCOs have their own patented technology, or maybe they combine a few different technologies, and focus very specifically on one or two links in the client's EE chain (i.e. pumps or motors). This type of company does not do exhaustive audits. Instead they sell technologies or technical solutions, guarantee the technology's performance, and then allow their customers to pay them back over time (using either the guaranteed savings or shared savings model—both are possible). There are many such ESCOs in China for example. Sometimes these ESCOs are big equipment suppliers with access to capital.
- iii) The third model of ESCO markets its ability to provide technical services. In this case, the ESCO approaches the client, provides a comprehensive audit, looks at whole system, comes up with a ranking of efficiency measures, and then decides which ones to implement. In many cases, it may be difficult to build a “fast business” from this approach in Brazil, India and China. Brazil and India each seem to have a number of ESCOs from this category.
- iv) The fourth model of ESCO marketing approach, which is exemplified most clearly in the Brazilian model, is colored by an alliance with a power company. Arranging financing through such a model is relatively easy, and the ESCO, by teaming with a strong, reputable power utility, gets added credibility. Yet the market is segmented for this type of approach because, as covered above, the EE interests of utilities are specific.
- v) The final and fifth model of approach, which is perhaps China-specific, is a “guanxi” based system. “Guanxi”, which loosely means “relationship” or “connections”, indicates that in this model, the ESCO has a pre-arranged relationship with the client (or a group of clients, as it has been the case with some Chinese chain stores). Since the two parties already have an established relationship based on trust or friendship, the ESCO does not need to spend as much time implementing a one-sided marketing strategy—making marketing easier. Once clients are secured, EE projects can be implemented backwards according to the clients' needs.

Based on these specific models, some specific issues were raised by some country delegations:

### ***Brazil***

Brazil seems to live along with all of these different models. Despite the fact that none of the speakers presented cases related to model 2, there are many Brazilian companies that do use this approach. For instance, some companies produce generators that operate during peak hours, thus reducing tariffs. They do this based on performance contracts.

Other ESCOs build substations to help with voltage migration—this too is based entirely on performance.

### **China**

Model 1, as presented above, is similar to the three pilot EMCs. Because of size and financing limitations, this model 1 approach is not valid for newly-developing EMCs. If the banking system would enter into the picture, there would be a lot of space for growth. In China, most of the EMCs are using model 2 (i.e. offering a specific technology for a specific solution). However, if a company depends solely on one type of technology, its approach can be overly simplistic. EMCA has been trying to emphasize the value of “system-wide” approaches, because focusing on only one technology has limits. There are relatively few model 3 and model 4 EMCs in China. As emphasized by the Indians and Brazilians, the comprehensive audit is crucial for the application of model 3. Chinese clients are unwilling to pay for these detailed audits, and the EMCs have had a difficult time conducting the audits on their own. Perhaps inviting the local government to play a role in conducting the audit could help overcome these issues. A fantastic customer base and a good market are crucial for the utilization of model 5, which does not have their own products or technologies. Finding technology that suits the customer base is tough though, and there are not a lot of EMCs that have this technical capacity.

On a more general note, it was mentioned that in the North American market, the guaranteed savings model is currently the main model used. This is because the clients see a value for the project. In the three targeted countries, it seems that clients either do not recognize the added value of the ESCO project or are just looking for financing. It was also stated that ESCOs offer a lot more than what an equipment provider can provide. If the client goes on without the ESCO, there is no savings guarantee. Plus, the client will likely fail to successfully manage all of the project’s various aspects. The difficulty is getting the client to acknowledge that (and pay for it). This added value has to be recognized in other ESCO markets if ESCOs can play a valuable role in the development of the EE market. In ESCO projects in the U.S., for instance, the technologies being used are often quite simple—it is the ESCO’s *idea* that is sold as an added value concept—not the technology. This message seems yet to be very difficult to bring to some other countries, though. The real value of an ESCO is not mainly its financial know-how or capabilities. If that was the ESCO’s true value, it would be mainly a bank. In some countries, it seems that without unique technologies, ESCOs have a hard time. Is the inherent value of ESCO projects not seen? Is the guaranteed savings approach workable in your countries? To answer these questions, the case of India and Brazil were specially analyzed:

### ***India***

Actually, in India, ESCOs are often known as needing more financial acumen than financial institutions. This is because ESCOs often have financial limitations (such as collateral issues: revenues cannot be used as a guarantee, etc) that force it to be very shrewd when evaluating projects. Also, as banks will not lend to ESCOs because of size or collateral problems, and as the client or utility does not generally want a loan on its balance sheet, the ESCOs are often forced into organizing funding for the project. This whole situation leads to some very savvy ESCOs that understand financial issues. Technology issues often take a back seat in this case.

Some Indian ESCOs have found that it is not necessary to use the shared savings model in driving their business. Many times, when ESCOs try to arrange financing, their clients (especially blue chip clients) are already borrowing at low rates. In this situation, it was best to look at the existing lenders for the client. It seems it is also being done a little bit in the two other countries. If you can get banks to accept a savings guarantee as collateral, then that is a good step.

One major concern was also mentioned related to the fact that diluting technical risk can leave client risk. The moment an ESCO displays an attractive, feasible project to a client, it is running the risk of the client rejecting the ESCO and conducting the project on its own. Six times out of ten, the client does this. It is important that clients realize the added value offered by an ESCO, and many Indian ESCOs believe that a guarantee fund would get this process started.

### ***Brazil***

Regarding the Brazilian model, since 1998, utility companies have been systematically investing in EE measures because of regulatory and legal requirements. This legal provision is used to leverage the private, non-governmental scheme. Brazil is currently trying to get new agents, such as pension or investment funds, to enter into the mix in this respect.

If the guaranteed savings concept is to develop in Brazil, more emphasis needs to be placed on this development—and you need stronger ESCOs for that. The more, stronger ESCOs you have, the easier it is to consolidate the idea and gain momentum.

The securitization of projects has been actively tried in Brazil, and will eventually become a source of funding for Ecoluz, a Brazilian ESCO. The difficulty is getting the capital together for getting the project off the ground—once this is accomplished, projects can become securitized assets. Also, you need enough capital to bundle a lot of large-sized projects

together. This is difficult if you want to implement a 7 million USD project, for instance. Most Brazilian ESCOs do not have this capacity.

Based on all the discussions held during the workshop, it appeared there was common agreement that there were specific issues related to the ESCO actual marketing process that each organization has to take into serious consideration:

- Targeting a solid and dependable client base is an important first step in the ESCO marketing process. Dividing prospective clients into various categories and targeting the high-percentage projects is an essential activity that has to be realized early in the process. For example, in India, these includes municipal DSM projects, EE retrofits in buildings, hospital projects and (with a little help from industry-specific benchmarking) possibly SMEs. Clients with weak finances are also often drawn to ESCO projects.
- Another essential point involved the client approach process. It was agreed that when approaching the client, most often it is best to start broad (i.e. by describing the ESCO concept, establishing ESCO credentials, etc.) and deal directly with high-level management.
- Questionnaires and a rough, imprecise walk-through audit are advised only once client interest has been secured, but a detailed audit should not be conducted until after the contract has been signed in discussions with the client.
- EE measures should not be referred to as “low” or “high” cost, as this can delay project implementation and can even result in the client undertaking the project without the ESCO’s help.
- Partnering with big names (like USAID or McDonald’s) tends to raise the ESCO’s credibility and trustworthiness among clients.
- There is a need for more clarity on how Guarantee Fund can help ESCOs to avoid the situations where the client implements the project itself after the ESCO carry out preliminary energy audit and submit to the client.

### **2.2.3 Barriers to ESCO Marketing and Some Common Solutions**

Many specific barriers have also been pointed out as key elements that are currently blocking the development of the ESCO market in the different countries:

- Client (and bank) mistrust/misunderstanding of the ESCO model

As it has been the case in each new country where the ESCO concept has been introduced, Brazil, China and India have all to cope with client mistrust and/or misunderstanding.

As potential solutions to address this issue, most ESCOs present had some «tricks» that could be used for increasing the credibility of the ESCO. These tricks included

partnering with government institutions, international agencies or big-name multinational companies. Other ways to overcome mistrust include popularizing the ESCO concept by sponsoring trainings, partnering with the media, etc.

- A lack of adequate policies/EE regulations

Policies that mandate higher energy efficiency standards and/or promote EE in other ways would obviously make it easier for ESCOs to market their business, but such standards are often not in place in the three countries. As examples, India's Shri Shatki ESCO cited the need for further price rationalization in agriculture, and China's Shanghai Shangliao EMC noted that a lack of mandatory, sector-specific EE standards as important barriers to ESCO marketing.

While it was recognized that few individual ESCOs are likely able to influence policy directly, recommendations was made to ESCO associations (if present), to act as a bridge connecting policymakers with the market. Also, many ESCOs (especially Chinese) noted the need to be constantly vigilant and aware of new policy changes, and how they might affect the company's marketing strategy.

- Measurement and Verification (M&V) issues

Monitoring and verification (M&V) issues are central to an ESCO's operation. As they often determine the amount of money to be saved and/or shared through a project, M&V approaches can be a deciding factor in convincing a client of a project's quality. With this in mind, many ESCOs—particularly Brazilian ESCOs—have called for a certain amount of standardization in developing an M&V protocol that, with the backing of organizations such as the World Bank, would raise an ESCO's credibility and put its client's mind at ease. Such a protocol, if simple, might be of use in India as well, where banks find existing M&V protocols too confusing and complex.

Many of the ESCOs present—especially Brazilian ESCOs—cited the need for a standardized M&V protocol to help them present a more attractive and recognized concept to their clients. It was agreed that a lack of such an internationally approved M&V protocol has negatively affected their marketing effectiveness, because clients want to see that the M&V protocol is not simply something developed by biased ESCOs. Clients want to know that this has been done successfully before, and the approach can be seen as credible.

There was some debate as to the merit of creating a standardized M&V protocol, but some suggestions that might help alleviate M&V-related marketing problems were brought up at the meeting. However, ESCOs from all three countries noted that the

M&V situation for each ESCO is different, and that no standardized document could possibly be of use to everyone. Additionally, standardized (but adaptable) M&V guidelines, as the one developed by IPMVP, have already been produced. Whereas Brazilian ESCOs concede that 100% standardization is impossible, they note that certain projects, such as commercial lighting projects, are conducted in essentially the same way all over the world. Producing a protocol with a certain measure of standardization might be possible for these projects. And anyway, the key value of such a document would not be its applicability to specific M&V decision making. If a generic document, perhaps with a few representative case studies attached, could be endorsed by the World Bank and presented to clients and/or banks, this would let them know that they are dealing with something that has been done before and approved by a reputable organization. This would be the real value of the protocol; it would make selling the ESCO concept easier.

Chinese EMCs acknowledge the importance of an appropriate M&V protocol, but are unfamiliar with IPMVP and other international M&V protocols. With this in mind, Chinese EMCs and the Chinese EMC association (EMCA) mentioned that they were eager to learn of experiences from abroad. Indian ESCOs echoed this call, and have proposed that Brazil begin trying a semi-standardized approach that both India and China can reference at a later date.

There was no final consensus on the M&V issue, leaving the subject to further discussions at other occasions. There was a clear agreement though that this subject is becoming more and more important in the development of the ESCO market in each country, and that some kind of reference document and standardized approach (if possible) should be considered.

- Capacity building for potential ESCO clients

ESCOs from all the three countries have reported that clients are often skeptical and/or under-informed about the ESCO concept. This has become a major challenge for ESCOs as they market their services. Brazilian ESCO representatives have indicated that, if one dollar was to be spent on capacity building, they would invest it in capacity building for *clients*, not capacity building for ESCOs. This is because of the fact that many ESCOs in each country are already well prepared for implementing EE projects in many sectors, but there is a lack of customers willing to stand up for the quality of these projects. To be successful, efforts at client education would likely need to be organized by a neutral third party, such as governmental organizations (EE agencies for example) or by IFI (the World Bank - education programs for example). Efforts organized by ESCOs or ESCO associations would not be ideal, as they would still be seen as too biased.

## **2.2.4 Summary of ESCO Marketing Strategies**

Marketing strategies used by different ESCOs in the three countries can be seen as very different, mainly adapted to the institutional framework of each country and on the possibilities to offer some kind of financing proposals to clients.

As ESCOs are all facing the same challenge of selling an innovative concept in more or less conservative markets and where energy efficiency is still not recognized as an important opportunity and/or need by many potential beneficiaries of such projects, many challenges still lay ahead. Some of them, like increasing awareness about energy efficiency and increased legal framework, will come in time with the support of many international and legal programs, as well as with the support of global environmental pressures to limit the climate change processes undergoing at this time. So others, as the increased recognition of the ESCO concept as a valid and interesting one for the implementation of EE projects will need continued support from the international community. More internal process issues, like the need to develop tools for M&V that can be recognized and easily used by different stakeholders (ESCOs, banks, clients, etc.) in the market will also have to be addressed one way or the other by the ESCO community itself, with the needed support from associations, specialized NGOs and so on.

As in any market, marketing issues will always be at the center of the preoccupation of the industry, and should be an important part of any future discussions in the context of the present project.

## **2.3 Equity Financing for ESCOs/ESCO Projects**

### **2.3.1 General Context**

In terms of project financing, ESCOs are left with mainly two choices: debt financing or equity financing. Debt financing can be especially difficult for ESCOs, as securitizing the receivables from projects is very difficult in any market (specially emerging ones), since potential lenders are wary of this approach. As an alternative, providing debt financing to clients can make things easier for the implementation of ESCO projects, but this approach has its difficulties as clients very often do not want to commit their financial resources to them. Loan guarantee funds can be used as a potential solution to such a specific problematic, but too often these funds do not meet the requirement that the ESCOs are hoping for. As such funds need to act according to bank-like risk mitigation measures, and although they may be willing to explore other more creative ways of collateralizing and/or securitizing loans, they will not allow ESCOs to receive un-securitized loans. Guarantee funds cannot, in short, solve by themselves all of ESCO's financing issues that are greatly limiting the development of the business activities in all the three countries.

When the three country project first began, significant enthusiasm was built up around venture capital (VC) funds and their possible role in contributing equity to ESCOs. At the time, there were many prospective institutions that project organizers thought might be worth exploring, so they pooled their efforts and tried to do some matchmaking between VC funds and ESCOs. Their efforts, which were not all-encompassing but were fairly representative, did not yield especially positive results. Attracting VC funds and succeeding with equity financing was possible, as shown by China's PowerU Company and some limited other cases, but the overall potential for this approach seems to be relatively limited up to now in the three countries. As VC funds are often unwilling to provide equity because there is a lack of adapted loan financing to leverage their activities, banks are unwilling to provide loan for project financing because of a shortage of equity, creating an impossible environment to launch the process.

Because of this important barrier, some ideas were exchanged during the discussions that are interesting to report:

- i) One possibility that was brought up and seemed worth exploring was the establishment of a large, financially-backed institution that would provide equity (and/or funds projects) for a series of ESCOs. Such an institution would essentially be a holding company that, through an alliance, would share project benefits with member ESCOs. Brazil, Eastern Europe and possibly Mexico have all indicated an interest in exploring this type of option.
- ii) Another idea might involve selling executed performance contracts to mortgage companies (or something analogous to a mortgage company), freeing the ESCOs more rapidly of their financing commitments and enabling them to use their limited resources to develop and implement more projects. There are some but limited experiences with this approach in the U.S. This may be a fairly sophisticated approach for China's situation, however, that may not be applicable in the current financing context.
- iii) Channeling equity financing into specific projects is another possibility. This approach would not involve a straight equity investment into an ESCO, but financial institutions such as Rio Bravo equity fund from Brazil have developed some expertise in developing such an approach.

### **2.3.2 Brief Overview of the Situation in Each Country**

#### ***China***

In China, the main experience presented related to equity financing in ESCO operations was the one of Beijing PowerU Technology Company. In this context, reviewing this company's experience is useful in that it informs discussions on the feasibility of equity investment in China's EMC sector. The PowerU Company's progression towards gaining equity financing is outlined below.

PowerU, as mentioned above, is a Chinese EMC that focuses on implementing cold storage air conditioner retrofits in large buildings (such as airports or large hotels). When this company first got its start in the late nineties, it had a fairly small registered capital. Capital problems still exist today, but are not nearly the limiting factor that they were initially.

The first crucial step toward gaining equity financing occurred in 2001, when the PowerU Company was in the process of developing a certain EE project. As it did not have the financials required for financing the project on its own, the PowerU Company sought out an investment firm (i.e. not a bank) to help with project financing. After thoroughly expounding upon the project's feasibility and profitability, PowerU convinced the investment firm (in April 2002) to invest all of the funds required for project construction.

The investment amount totaled 20 million RMB (or about \$2.4 million USD). Initial project benefits were entirely given to the investment firm until it earned back its initial investment, and then project earnings were divided according to a pre-agreed ratio after that.

The experience with this investment firm led to expansion in the size and scope of PowerU, which made it more attractive to banks as a recipient of commercial loans. PowerU had a long-standing account at the Industrial and Commercial Bank, so the bank knew of PowerU's cash flow and profitability. It also knew that PowerU had the capability of implementing high-quality projects. As a result, the bank agreed in principle to provide loans to PowerU so long as PowerU used its patent rights as collateral. The most important reason for this openness on the part of the bank was PowerU's size and capital—which had grown thanks to its project financing experiences with the investment firm.

At the end of 2002, PowerU began looking for equity financing. The whole process for gaining it took about 13 months, and by the end of 2003, PowerU had come to an agreement with a Tsinghua venture capital company for equity investment in the firm. The venture capital company manages a fund called the China Environment Fund (CEF), whose main investors include the Asian Development Bank and Hong Kong's LESS Investment Company. PowerU notes that these investors have strict requirements. Specifically, they require that you have very clear accounting and financial practices, good management and a good business approach. When PowerU learned of these strict requirements, it was able to improve upon its business and become more attractive in many different ways.

Living up to the high standards of venture capital investors put PowerU in a good position to gain a loan guarantee through the second phase of the World Bank/GEF project, which it did in early 2004. PowerU feels that one important benefit of the I&G loan guarantee process is that it teaches ESCOs the importance of standardized management and financial practices. If no institution imposes such strict requirements on ESCOs, then they will tend to continue using unclear or non-transparent methods, thus remaining unattractive to investors. It is only after ESCOs thoroughly examine their own situation and make appropriate adjustments (based on the demands of investors) that they can attract investment—equity investment or otherwise.

Unfortunately, no other direct experience for ESCOs working with equity financing was presented at the workshop, limiting the capacity to understand more the real status of such a mechanism in the country

## **India**

A study has been conducted in India which attempted to discover how best to tap VC funds in the ESCO market. For the purpose of this exploration, equity options included venture capital, angel funds, support from a super ESCO and support from international financial institutions.

India's VC sector was stagnant until 1996, despite the liberalization of the economy in 1991. Up until 1996, the VC sector was mainly occupied by risk-averse financial institutions that used VC as a way to supplement traditional loans. So this VC sector remained essentially untouched until the Securities and Exchange Board of India helped open things up in 1996.

Currently, there are essentially three types of VC categories operating in India.

- i) The first involves banks and financial institutions, which continue to be risk-averse. They use VC to support their other, more traditional loan-based approaches, and generally use it in the context of pursuing social objectives (such as supporting SMEs or "sick businesses"). If the government were to promote mandatory EE regulations, this VC category might eventually become a valid choice for ESCOs.
- ii) The second active VC category is made up of more aggressive VC firms, and is geared toward start-up businesses that have attractive returns. This category has primarily focused on "hot" sectors like biotech or information technology, and sees little potential in the EE market. VC investors in this category perceive the EE and industrial sectors as having too much government influence; only one VC firm was coaxed into saying that the EE market might have medium-term potential.
- iii) The final VC category in India is similar to the second category outlined above, but is made up of VC funds that have a specific focus on either EE or environmental concerns (such as the Asia West Fund). These funds have adopted a "wait and see" approach, and are currently not especially active.

Most venture capital investors feel that a policy-related kick-start is needed before the EE industry will be ripe for investment. Additionally, most VC investors would like to see less government participation in the EE sector before they begin to think seriously about investing there. The size of ESCO's deals is also a concern, as small projects are generally a turn-off. Increasing the size of ESCO's projects would act to spark investors' interest. Finally, many VC investors feel that ESCOs would benefit from a more aggressive marketing effort to drive up awareness. Intellectual property issues are also a concern, and would need to be addressed before VC investments could be successful.

Indian ESCOs noted that, as long as a project is viable, getting money from banks is not difficult. But, when there is a balance sheet problem (i.e. if the ESCO is not big enough or "bankable") the ESCO gets stuck. This is because the future revenues from projects

cannot be used as collateral. This leaves small, first or second-year ESCOs with financing difficulties. This is where, according to some Indian ESCOs, a leasing mechanism may prove useful. Leasing companies are not averse to take future revenues, and once few projects are completed using this method, financing would become less of an issue for ESCOs.

### ***Brazil***

In Brazil, there is a general downward trend in equity investments. This is due in part to the Argentinean economic crisis and perhaps the result of a recent presidential election. It follows that the majority of the capital in private equity funds has already been spent, and much of it is now in the disinvestment stage.

The industry for Brazil's domestic VC funds was initiated in 1996. Such funds are regulated by the Brazilian government, and are only allowed to invest in equity—they cannot write out loans. The main investors in these funds are development agencies, which generally have one of two goals: either supporting specific industries (like IT) or supporting specific geographical regions (like impoverished areas). The participation by pension funds or private investors is negligible.

Of all VC funds currently active in Brazil, three focus on energy. Unfortunately for ESCOs, the largest of these only invests in power generation and is thus not relevant to equity financing for EE. The other two funds do, however, offer interesting possibilities for ESCOs. On the whole, Brazilian equity fund managers, even if they are aware of Brazil's EE potential, are undereducated when it comes to the specificities of the ESCO concept. ESCOs continue to be viewed by these fund managers as purely service companies, when in reality they offer a mix of technical and financial service. This setup confuses fund managers.

Rio Bravo is one example of a firm that has this expertise and is comfortable with equity financing into ESCO projects. Rio Bravo is a non-banking financial institution that has experience with equity investing in Brazilian ESCOs (namely the Ecoluz ESCO). The firm essentially raises money and invests in projects, thus reducing capital costs for companies and cutting banks out of the loop. Below is a summary of Rio Bravo's view of the equity financing situation in Brazil, as well as an outline of challenges and opportunities facing ESCOs as they attempt to harness equity financing.

Now is a critical time for equity financing in Brazil's ESCO market. An infusion of new funds may be on the horizon, so ESCO stakeholders must act now to ensure that a portion of this money is directed at EE investments. A good way to do this would be championing the cause for mandatory energy audits and/or attracting attention to the ESCO market in any way possible. Stakeholders should join forces and approach various sources of

funding; doing so may result in a fund that really focuses on the EE industry. If this opportunity is missed and the new money is invested elsewhere, it is difficult to say when another opportunity will arise.

ESCOs welcome the participation of foreign VC players, and indeed believe that the Brazilian market is very attractive to foreign investment. They note that there have been successes and failures. Specifically, a French VC group was successful at setting up a joint venture. One American company that invested in ESCOs went bankrupt, however. The ESCOs note that this was not because of the market, but because the American investors did not understand the local market.

### **2.3.3 Barriers for Equity Financing and Potential Solutions**

Based on the discussions held during the workshop, it appeared there are a variety of difficulties facing ESCOs as they pursue equity investment. In addition of an important unfamiliarity on the part of fund managers about the ESCO concept, these include, first and foremost, a general scarcity of domestic equity sources. There is simply not that much money available, and as noted in the different general presentation from each country, most eligible funding is public sector-dependent.

Small company size is another obstacle. VC capital firms are looking for relatively large companies to invest in, but as the example of the majority of Brazil's 72 ESCOs, ESCOs tend to be small in each country, with only a handful of employees. A critical mass that does not exist at this time would be needed to attract the attention of the actual VC funds. Additionally, ESCOs need to work on corporate governance and financial reporting procedures, which does not seem to have a good capacity of. Because of contingent liabilities related to outsourcing, Brazilian ESCOs for example sometimes fail to fully comply with tax laws.

To add to matters, ESCOs themselves are often wary of VC funds, and see them as an outside force which does not understand the ESCO business yet wishes to control things anyway. For this reason, ESCOs sometimes view the capital gained through VC funds as too expensive. This mentality also needs to be overcome if VC and equity investment is to succeed.

For all of the obstacles, there are still several reasons to be optimistic about VC investment in the three countries:

- i) First of all, it is widely believed that an energy crisis is either a reality or looming on the horizon in each of the three countries. Fund managers are certainly aware of this, and understand that increased action in the EE sector will be needed if the crisis is to be averted. This bodes well for investment in the ESCO sector—at least in the intermediate term.

- ii) Additionally, investors interested in this sector perceive the ESCO market as being fragmented, with many small companies but a lack of larger players. This, they feel, is a recipe for consolidation. The business mergers that may arise thanks to this situation—though perhaps not an ideal solution for ESCO managers—would be appealing to VC funds and equity investors.
- iii) A general appetite for investment in technology suppliers in all countries may also lead VS fund managers to develop an interest in the ESCO market, as it can be seen as a way to promote and sell these new technologies.

Investing equity on a project-by-project basis is another possibility worth exploring. There are a number of issues that must be addressed if project-specific equity investment is to be realized, however:

- Project financing is generally not a core activity of VC funds. These funds are generally geared toward identifying solid companies—not solid projects. As VC firms become more familiar with this type of ESCO financing, they may begin exploring it more seriously.
- Project size is another concern. The transaction costs associated with investing in ESCO projects is usually quite high because the average project is simply too small. Larger projects would be needed to solve this problem.
- Also, clients may become impatient with the time required for raising capital on a project-by-project basis. Hence, investment in specific projects would need to somehow involve investment on a short timeframe. A final problem associated with project-specific equity financing is that pension funds are more likely to invest in structured, finance-backed securities.

In the end, it was mentioned that it would be a good idea to explore some new business models. One of these may involve modifying leasing agreements so that leasing rates and payback periods can be calculated based on expected energy savings. To minimize disputes, the participatory EE companies in such a setup would need to ensure that it leases out only high quality EE equipment. In case of equipment failure, a buy-back clause could be worked into the contract, thus giving the client the option of returning the equipment.

Structuring a “super ESCO” to invest in many projects, as mentioned above, is another possible path for achieving equity investment in ESCOs. Such an institution would need to have both the EE and financial expertise required for a successful ESCO operation, but should not be a competitor for existing ESCOs. The institution would need to avoid conflicts of interest and not favor one type of project over another simply because of familiarity. To make investing in projects easier, the super ESCO would need to function as a pre-approved “revolving line”, thus cutting down on decision making time, and would need to be “light” enough to invest in both small and large projects. Also, such a dedicated

investment vehicle should exclusively avoid focusing on equity investment. Equity funds are relatively inflexible in their investment structures because of extensive regulation on the part of the Securities and Exchange Commission, so the super ESCO would ideally be structured in such a way as to allow for more flexible investment schemes.

## 2.4 ESCO Associations

During the workshop, a specific session was devoted to an exchange between the two ESCO associations found in the three countries, ABESCO from Brazil and EMCA from China.

A summary of these presentations and exchanges is presented below.

### 2.4.1 Presentation of the ESCO Associations

#### *The Chinese ESCO Association (EMCA)*

China's ESCO association, the Energy Conservation Service Industry Committee (termed "EMCA" for short), was founded in April 2004. It was established as the chief implementation body for phase 2 of the World Bank/GEF project, and has attracted 89 members since its founding. Serving these association members and establishing sustainable development—both for China's EMC industry and for EMCA itself—are the association's stated goals. It accomplishes these goals by providing a variety of services to association members, acting as a "bridge" between the government and the EMC market, and forming partnerships with a variety of other organizations and/or energy-related projects.

EMCA leadership includes Mr. Shen Longhai, Mr. Chen Shuzhong, Mr. Xu Fei, Mr. Zeng Wu and Dr. Jiang Yuanfu, all of which offer a deep understanding of the Chinese market and of energy topics in general. Six other employees bring total EMCA staff numbers to 11. These employees are divided over four separate departments, including the training and planning department, the IT and research department, the market and member development department and the comprehensive department. As a young organization with a limited number of employees, EMCA still faces human resource issues from time to time. To cope with the heavy workload, cross-departmental cooperation is sometimes necessitated.

EMCA's business scope can be summarized based on the following categories:

- i) Dissemination activities
  - Disseminating relevant government policies
  - Disseminating/popularizing the ESCO concept
  - Holding sector-specific and region-specific meetings: these have included market development meetings geared specifically toward the needs of EMCs in various

regions (such as Beijing, western China, etc) and sectors (such as the chemical or building sectors)

- ii) Technical assistance and consulting services
  - Providing EMCs and EMC customers with trainings, technical assistance and consulting services
  - Helping EMCs deal with financing issues by constructing a platform for discussing financing issues
  - Encouraging cooperation between EMCs and EE equipment suppliers, EMCs and foreign ESCOs, EMCs and research institutes, as well as encouraging inter-EMC cooperation
  
- iii) Cooperation and communication
  - Establishing and maintaining an association Website, which provides an online platform
  - Communicating with foreign ESCO associations; EMCA has recently visited the Japanese and Korean ESCO associations; has had various exchanges with NAESCO representatives; and will be going to the U.S. and Canada in the near future. Through these international communications, EMCA has increased its capacity and become better able to serve association members
  - Maintaining and strengthening communication with EE centers, sector associations and other relevant institutions
  
- iv) Capacity building
  - Striving to increase EMCA's capacity as a duty to association members
  - Standardizing operations and opening up fields for business
  - Linking the EMC concept up with the "green lights" program (UNDP), and also hooking EMCA up with the WWF for developing EMCs in China's west
  - Publishing a newsletter
  - Undertaking sector-specific research and policy research
  - Developing representative case studies for distribution
  
- v) Members (89 members)
  - 52 ESCOs (58%)
  - 15 EE equipment suppliers (17%)
  - 4 investment companies (4%)
  - 6 foreign-funded enterprises registered in China (7%)
  - 5 energy efficiency centers (6%)
  - 7 related firms, including banks, law firms, accounting firms, research institutes, etc. (8%)

EMCA leadership notes that the Chinese EMC market has ample potential, and that there are many EMC success stories to discuss. A variety of highly-educated people are now taking part in this EMC movement, and their participation is playing a role in pushing the movement forward, as is the ever-increasing interest of banks, investors and guarantee companies. Many foreign companies, suppliers and ESCOs have also begun showing interest in China's market, and indeed some are beginning to establish joint ventures.

Lately, EMCA has begun emphasizing a move away from single product or single technology EE projects in large enterprises, and notes a trend toward a more comprehensive approach. This demand for a comprehensive approach has also begun pushing the EE industry forward.

There are a variety of new developments that are providing EMCs with new opportunities. EMCA has done its best to grasp these new opportunities and turn them into actual benefits for association members. These new opportunities include a strong policy-based initiative from the National Development and Reform Commission (NDRC) that stressed the use of market-based mechanisms in achieving various EE goals, the coming into effect of the Kyoto Protocol and the CDM, and the enactment of the "Renewable Energy Law", which will take place on January 1, 2006. EMCA is charged with exploring each of these new developments and determining the scope for EMC participation.

EMCA currently faces a number of challenges as well. Most notably, a relatively large percentage of China's ESCOs are small, weak, and have little market experience. By communicating more with foreign "sister" ESCO associations and/or gaining the assistance of foreign ESCOs, EMCA hopes to help narrow the gap between China's EMCs and foreign ESCOs.

### ***The Brazilian ESCO Association (ABESCO)***

Brazil's ESCO association (ABESCO) recently decided to turn its marketing strategy toward the market itself. Through this strategy, ABESCO hopes to run itself as a business with its own image, thus attracting more attention to the EE market and, ultimately, increasing the competitiveness of the Brazilian economy through ESCOs and EE approaches.

Founded in 1997 with 15 members, ABESCO has since grown to 40 members. Most of these members are located in Brazil's industrialized south or southeastern areas, and, as with Chinese EMCs, most are relatively small. This presents a challenge for ABESCO.

The association itself plays a central role in harmonizing the interrelated activities of its members, the consumer market, governmental bodies, the financial market, equipment

suppliers, utilities and society as a whole. The association attempts to lead all of these institutions to a positive result.

A global analysis of Brazilian ESCOs has been done by ABESCO and strengths and weaknesses, and threats and opportunities have been presented:

- Strengths of Brazilian ESCOs:
  - Geographic distribution is compatible with market opportunities
  - Excellent technical qualifications (they have significant technical capabilities)
  - Rapid decision-making (the owner is generally conducting the show, so there is less bureaucracy than with a big company)
  - Good integration, cooperation and exchange between ESCOs
  
- Weaknesses of Brazilian ESCOs:
  - Company management is often overly technical
  - ESCOs lack strategic vision in the market
  - ESCOs lack capital
  - There is a general lack of legal backgrounds and understanding
  - ESCOs do not possess the means required for diminishing investment risks
  
- Threats: critical success factors
  - Lack of knowledge in the market concerning EE measures
  - Lack of mechanisms for financial guarantees, no special lines of financing
  - Lack of special financing (from Eletrobras) dealing only with utilities
  - Laws which secure contracts for public services
  
- Opportunities:
  - Possibility of a new energy crisis
  - A rise in energy tariffs
  - Regulation of the EE and energy markets; this is being discussed in Brazil
  - Pressure of competitive market in terms of cost reduction—more competition is generally a good thing in this case
  - The world is preoccupied with sustainable development and environmental impact. This is evidenced by increasing concern over global warming. Emphasizing social benefits is important for the success of ESCOs. The Kyoto protocol is a driving force, so EE must be clearly linked to reducing GHG emissions.
  - Government support for projects of technological innovation. Projects involving technical innovation generally have the full support of the Brazilian government

As mentioned above, ABESCO has increasingly focused on its image and attracting more attention to the Brazilian EE industry. There are a variety of ways the association has gone about accomplishing this. The first involves the construction and maintenance of an interactive Website, which was launched in December 2004. The Website is designed to be dynamic and reflect all of the various players in the EE market. Also in December 2004, the association began publishing weekly newsletters. In just a few months, the number of newsletter subscribers has grown significantly, and many new requests continue to come in. Membership increases have averaged around 10% per month, and very few organizations have opted for exclusion from the list of subscribers. In July 2005, ABESCO will launch an EE magazine to supplement its other activities in this field.

- Events

Three regional, ABESCO-sponsored meetings are scheduled for 2005. The purpose of the meetings will be to bring together relevant players and discuss region-specific topics of interest to these institutions. As each region has its own specific cultures and needs, the meetings will be customized to meet these needs. The activities will likely devote one day to utilities and the “free consumer market”, and another day to specific topics dealing with energy efficiency itself (such as cogeneration, etc). In November 2004, ABESCO was successful at holding a large-scale event (co-funded by the Three Country EE project) that attracted some 220 participants.

- Partnerships

ABESCO places heavy emphasis on establishing strong partnerships with a variety of organizations. The association sees these partnerships as critical in broadening the association’s reach, building capacity, and strengthening the association’s ability to exchange information with relevant players. Partner organizations include (but are not limited to) Flesp, PROCEL, Petrobras, IPT, the World Bank, the United Nations Foundation and various regional federations.

- Trainings

Several training courses dealing with ESCO management, legal details, financial approaches and ESCO technical qualifications have been offered through ABESCO in association with the Canadian government, the World Bank, the United Nations Foundation, GERBI and the three country project.

- ESCO Certification:

ABESCO also aims to establish an ESCO certification scheme that provides ESCOs with an avenue for accrediting their businesses. Any such scheme would need to be carried out

in a manner that enables all ESCOs—regardless of size—the chance to gain accreditation. As the accreditation process would certainly have costs, designing a scheme that does not favor relatively wealthy companies would be a challenge. Ideally, small and medium-sized companies would need access to the process as well.

## **2.4.2 ESCO Associations Exchanges**

### ***Financing of ESCO Associations***

- EMCA

Currently, EMCA receives funding from four sources. The first of these is the World Bank and GEF project. As EMCA is the main implementing body for the second phase of this project, the association gets regular support from the project budget. Second, member fees and donations are another source of income for EMCA. This category makes up a relatively small percentage of EMCA's income, especially in comparison to the Korean or Japanese ESCO associations. A third source of money for EMCA is collected from charging participation fees at certain events (such as technology expos). Finally, through providing specific research and information, EMCA is able to receive money from other relevant projects (such as the "green lights" project or ESCO projects in association with the World Wildlife Federation (WWF)). EMCA's goal is to eventually attain economic sustainability. Hopefully, if EMCA is successful in helping its members flourish, they will be able to afford paying more in membership fees.

- ABESCO

ABESCO, like EMCA, collects membership fees. These are not enough to cover all of the association's costs however, so supplementary revenue is sought through other channels. Such additional funding can be found through establishing partnerships (i.e. certain partner companies might help ABESCO arrange an activity, and the revenues from that activity might be shared between the two organizations). ABESCO has also gotten some contributions from the World Bank (through the three country project) and various government institutions. These organizations have been especially helpful with putting together training courses. ABESCO's Website also generates some revenue through advertising. ABESCO believes that creativity is needed in trying to raise money—but stresses that the association's main goals not be forgotten in the interest of raising more money.

### ***Monitoring of ESCO activities***

EMCA monitors its members on a bi-annual basis because of World Bank's mandate; the World Bank audits project activities every half-year, so EMC monitoring is required.

Questions to members are generally geared toward gaining an understanding of how many projects have been completed and how much energy has been saved as a result. EMCA also devotes a significant amount of time to identifying the particular needs of association members. For instance, do members have financing, investment or technical issues? This helps EMCA to better tailor its services. At present, EMCA is trying to encourage its employees to actively explore the needs of members.

Regarding NAESCO's Website, EMCA believes that it is worth studying. EMCA's Website has already surpassed 120,000 "hits", but notes that ABESCO's Website has some definite strong points.

### ***Publications***

ABESCO presented its project of publishing an EE magazine. Questions were raised about who will finance the magazine? Will it be profit-based? Will ABESCO do it on its own, or will some other organization help out?

ABESCO answered these questions by mentioning that everything it does is accomplished through partnerships. For the magazine, a partnership has already been established with a publishing house. In creating the magazine, ABESCO was careful to prepare a well-done product. The magazine is not simply a brochure—it has high-quality, glossy paper, etc. This way, readers get the impression that the association is a high quality organization that means business. So, in short, ABESCO will handle the magazine through serious partnering with a publishing house.

The magazine itself will be self-sustaining. This will be accomplished by inviting companies to advertise in the magazine. With this in mind, ABESCO will focus the magazine's content on the entire EE market (including power generation, technical issues, etc)—not just ESCOs. This ensures that the maximum amount of companies will be interested in advertising through the magazine, and that the maximum amount of revenues will be generated for both ABESCO and the publishing house (and the advertising companies themselves).

### ***Accreditation***

Another issue that would have benefited from more discussion is accreditation, but there was not enough time at the meeting for discussing this. Both associations indicated an interest in this topic, and see prospect for future discussions.

### 3 MOVING FORWARD

At the conclusion of the three country conference, each participatory nation was invited to reflect on the lessons learned from the conference and indicate how they would proceed in the future.

Below are the reflections of all the three countries involved. They cannot be presented in any structured form, as each country made a very different presentation than the other.

It is to be noted that the China's recommendation was only presented after the conclusion of the workshop, so an integral presentation of its document is presented here.

#### 3.1 India

##### 3.1.1 Guarantee Funds, Investor and Client Confidence, etc.

The Indian financial market is more mature than the one in China. The State Bank of India has thousand of branches, and many other banks are present as well. The problem is that most of these institutions are only comfortable with balance sheet financing. In fact, they are reluctant to finance an ESCO if balance sheet financing is not involved. In addition, clients often gain the support of the banks not because of the quality of their concepts, but because of their history with the bank—making things difficult for new and/or small ESCOs.

ESCOs are a new concept in India, but everyone understands that energy efficiency is important. With this in mind, large companies can operate under an ESCO approach because they already have good relationships with banks (and good balance sheets). It is tougher for smaller ESCOs, though so confidence-building measures are needed to ensure the participation of investors and clients in large *and* small projects. There are several ideas that might accomplish this. First of all, when it comes to small projects, IREDA is attempting to develop “cluster-projects” in certain industries. If these are expanded to include various SMEs and some success stories are produced, there may be some potential there. Also, by acting as an “Indian I&G”, IREDA might be able to boost the confidence of both clients and lenders.

Setting up a guarantee fund might also go a long way toward boosting lender confidence. To this end, many Indian ESCOs are willing to pool their resources and establish a corpus fund which may act as a guarantee fund. ESCOs might contribute up to 10% of corpus. This will be discussed as a top priority upon arrival in India. Other standby guarantee facilities, such as those being set up by USAID through YES bank (\$5 million US) should also be thoroughly explored. Overall, the participation of the World Bank would really move the bureaucracy in India when it comes to establishing an ESCO-specific guarantee fund.

### **3.1.2 An Indian ESCO Association**

In Brazil and China, professional associations have spearheaded the ESCO movement, and ESCO industries have gained momentum as a result. India might learn from this. Indian ESCOs need an alliance or coalition in the near term (1 year), and perhaps after three years this coalition could evolve into an ESCO association. The task of such an association would be to bring together a professional body of EE stakeholders, including ESCOs, EE consultants, certified energy auditors, equipment manufacturers, banks, financial institutions, accountants, lawyers and policy analysts.

### **3.1.3 Other Points of Interest**

Other issues were presented as showing interest in the future development of the ESCO market in India:

- The scope for further ESCO development in other sectors (i.e. not just government buildings) needs to be explored;
- A progressive, interactive discussion with banks (one that identifies the strengths and weaknesses of the existing system) needs to be pursued;
- Developing a registry of ESCOs (like in South Korea) might help to build credibility and confidence among lenders and clients;
- Developing a framework of standardized documents (including M&V protocols, sample contracts, etc) and presenting this package to clients and/or banks might help to alleviate their skepticism;
- Utility-driven DSM measures such as peak shaving can benefit Indian utilities. Using the Brazilian experience as a reference, the possibility of Utility/ESCO partnerships should be brought to the attention of regulators in India;
- The possibility of creating demand-pull for energy service through income tax rebates (on payments made to ESCOs or EE projects) should be explored;
- ESCOs need to talk with banks about scaling up EE and ESCO schemes for SME.

### **3.1.4 India's Action Plan**

- i) Organize a discussion forum for banks and ESCOs. The main goal of this forum will be to disseminate what has been learned from the Beijing exchange.
- ii) Work with SBI and other Indian banks to build a database of EE projects that have received financing from them.
- iii) Compile information on securities and collaterals sought by banks for EE projects.

## 3.2 Brazil

### 3.2.1 What's been learned?

- There are many problems that are common to all three countries. Low awareness and/or mistrust among clients are prime examples. With this in mind, there is a need for dissemination activities that convince end-users, financial institutions and utilities that ESCOs use a good business that is beneficial for everyone.
- ESCOs must become bigger if they are to attract investments. The large majority of ESCOs in Brazil are SMEs, and as most of them need to attract financial investments, they need to become larger.
- The Indian program of energy audits is very efficient, and should be part of the Brazilian model.
- Government's support is fundamental until ESCOs can stand on their own feet. Very few startup ESCOs can carry out the business by depending on their own funding. Also, it is important to note that, because of policy changes, funding from utilities will decrease in the near future. If ESCOs cannot stand on their own before this happens, they may disappear.
- Brazil has high interest rates, so it is more difficult to use third party financing.
- There is no structure in Brazil related to M&V issues. Some M&V protocols have been developed by various ESCOs, but they remain unclear to most utilities and end-users.
- There is a great potential for EE in Brazil, but it has yet to be explored thoroughly.

### 3.2.2 Where to go from here?

- ESCOs need to couple financial and technical expertise. Brazilian ESCOs forget too often about the financial side of things, even though EE projects are heavily based on financial details. Indeed, the EE project process often enters the legal and financial spheres, and spends less time with technical details.
- ESCOs need to be brought together with manufacturers and funds. Rio Bravo is a good example, but manufacturers continue to see themselves as ineffective ESCO partners. If manufacturers were drawn into effective partnerships with ESCOs, financing might become a little easier. But currently these manufacturers don't effectively take part in the projects—they merely play the role of suppliers.
- Most Brazilian ESCOs solely focus on electricity, but focusing on water and oil projects (as done in India and China) is important as well. This emphasis on electricity is largely because of the influence of utilities on the Brazilian ESCO market. In the future, ESCOs should take a more comprehensive approach (not just power).

### 3.2.3 Other Points of Interest

- A common M&V protocol is needed, and would be useful for all three countries. There must be a common basis for all three countries, and ideally the protocol would be endorsed by the World Bank. The availability of such a protocol would play an important role in helping ESCOs “sell” EE projects to clients
- Education for ESCOs on corporate governance, financial practices, accounting standards, carbon credits, sales and marketing are all needed in Brazil as well.
- EE needs to be linked up with GHG emission reductions and the growing environmental demands of society as a whole.
- The EE industry in Brazil would benefit from more lectures and seminars.
- If more utilities were attracted into ABESCO membership, the industry as a whole would benefit. It is important to remember that utilities can also be association members.
- There is, in the opinion of the Brazilian team, a need for a guarantee fund—even if it is only a domestic guarantee fund. Brazil would like the World Bank’s support on this, but if this is not possible, they are willing to fully explore the possible role of domestic banks and/or financial institutions in contributing to the fund. A guarantee fund would make it a little easier for small and medium-sized ESCOs to operate. It is not that small/medium sized companies have been forgotten in Brazil, but the trend is that big companies get favored. A guarantee fund may solve this.

## 3.3 China

All together, the Chinese delegation comprises 32 members—17 of which offered remarks at the three country meeting. Participants represented various relevant institutions and companies from all over the nation. Below are records of the Chinese delegation’s experiences from the meeting, as well as an indication of what the China team intends to do in the future.

### 3.3.1 Experiences from the Meeting

#### i) Financing issues

India’s introduction to innovative approaches at financing—namely the EE-specific financing programs established by three main Indian banks and an ESCO-supported guarantee fund—were interesting and valuable to the China team.

It was enlightening to learn of how Brazilian ESCOs have implemented projects through client financing. This approach needs to be used more in China.

Although China has currently the support of the WB/GEF loan guarantee program, this is not enough to satisfy every Chinese EMC's needs for financing. With this in mind, China is eager to explore as many financing avenues as possible.

ii) Marketing and market development

From the meeting, the Chinese delegation learned that each country uses different marketing techniques to cope with differences in market segmentation and characteristics. As far as Chinese EMCs are concerned, future emphasis will be placed on developing two types of markets:

- Public facilities and government buildings: The Chinese government has already established its "Mid- to Long-term Plan for Energy Conservation", which laid out EE projects in government institutions as one of ten major focus areas. This represents a huge potential market in China.
- Projects in cooperation with energy providers: In China, suppliers of power, oil and natural gas are all essentially government-owned. Chinese EMCs, unlike Brazilian ESCOs, have done essentially nothing in the utility sector. In the future, Chinese EMCs need to develop market-development partnerships with these energy providers.

iii) Accreditation for EMCs

Various countries throughout the world have had successful experiences with ESCO accreditation. As EMCA membership is already around 100 members, and as many of these members are operating under a standardized ESCO approach, the China team sees a definite need for EMC accreditation. EMCA itself is eager to begin discussing this topic with other nations, and in due time, will initiate its own accreditation scheme.

iv) ESCO associations

One main point here is that ESCO associations can make use of various means (dissemination brochures, magazines, a Website, etc.) to increase the association's exposure to society as a whole. Additionally, ESCO associations need to be creative when it comes to raising money. They should establish a plan in that respect, thus ensuring a stable yearly income and economic sustainability for the association itself.

### 3.3.2 Action Plan

- i) In order to go one step further in increasing public awareness about the ESCO concept, the China team plans to push hard for including the ESCO mechanism—by name—in the Chinese government's Energy Conservation Law. This would provide an extra "selling point" when disseminating this concept, and make it easier to overcome

the serious problem of unfamiliarity with the ESCO concept (which all three countries seem to be struggling with).

- ii) ESCOs and ESCO associations that are involved with the three country project should expand their scope for cooperation and dialogue. Perhaps establishing regular meetings that allow for the exchange of products, technologies, or experiences in general might be helpful.
- iii) In conducting trainings, publishing magazines or maintaining association Websites, the two ESCO associations (and India's fledgling ESCO coalition) should do everything possible to disseminate the technologies and experiences of the other countries and ESCOs involved in this three country workshop.

## 4 FINAL OBSERVATIONS

The present workshop enabled the participants to exchange on many of the core issues related to the ESCO market development in each of the three targeted countries.

It can be reported that in each country, but in different ways, the ESCO concept is growing and many initial barriers that were present a few years ago have been removed.

The different presentations demonstrated that the approach to the market can be quite different from one country to the other, in relation with the institutional framework, the ability to provide financing and the cultural aspects on how to approach clients. Interesting experiences were shared with the different delegations and a lot of interesting ideas seem to be promising to other countries. As an example, the role of utilities for the development of a DSM approach to ESCO development seemed to be of interest in China, where this model is not at all introduced.

On the equity side, it appears that this is still a very small market at this time, and very few examples could be shared. On the other hand, the two success stories that were presented, the one from PowerU in China and the role of Rio Bravo in Brazil were impressive, and demonstrate that there is certainly an interest in trying to develop similar experiences in each country.

The organizers of the workshop were impressed with many ideas proposed, like the one from Indian ESCOs making contributions to their own guarantee fund—even if they only offered small contributions. This is an important market driven initiative, and we can only encouraged a discussion with India's core group, including banks, and keeping the ball rolling in this respect.

Many issues still need to be work upon, based on the conclusion to this workshop. Among others:

### **On the ESCO marketing side:**

- i) Continued capacity building in each country about the ESCO concept, mainly at the client level, in order to increase the credibility of the approach in the market;
- ii) Development of a M&V protocol that could be recognized as a credible mechanism, as well as being simple in its application
- iii) Work on the development of sustainable DSM type of approaches with utilities for ESCO projects, based on the initial experiences presented by the Brazil and Indian delegation

### **On the ESCO equity financing and project financing sides:**

- i) Increase the knowledge of the ESCO opportunity at the VC level
- ii) Develop a national mechanism to support access to adapted financing by ESCOs, such as partial guarantee funds, Super ESCO to «buy» the project at an early stage from ESCOs

**On the ESCO association side:**

- i) The need of an ESCO association seems obvious, and India should try to develop such an organization in the near future;
- ii) The continued development and increased capacity of such organization, in order to support the development of the market;
- iii) Continued exchanges between these organizations, in order to address important issues as sustainable financing mechanisms and accreditation for example

The conclusion of the workshop is that such events are bringing an incredible added value to the participants, and that these should be continued in the future.

## **ANNEXES**

## ANNEX A: WORKSHOP PARTICIPANTS

### Cross Exchange Workshop on ESCOs and Equity Financing 节能服务公司/股权融资国际交流研讨会

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**UF, UNEP, The World Bank**  
**Financial Mechanisms for EE projects in Brazil, China, India**  
 Workshop on ESCO and Equity Financing - Summary

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**ANNEX B: WORKSHOP AGENDA**

**UNF/UNEP/World Bank**

**Developing Financial Intermediation Mechanisms For Energy Efficiency  
Projects In Brazil, China and India**

**Workshop on ESCOs and Equity Financing**

**WORKSHOP AGENDA**

**April 13<sup>th</sup>, 14<sup>th</sup> and 15<sup>th</sup> 2005  
Beijing, China**

**DAY 1, APRIL 13<sup>TH</sup>**

9:00 Welcome

*Speakers:*

*Chinese government official to be confirmed  
URC  
Mr. Shen Longhai, Director of EMCA  
Bob Taylor WB*

9:45 Introduction

- Purpose of the workshop and expected outputs
- Ground rules for the workshop

*Speaker: Pierre Langlois, facilitator*

10:00 Break

10:15 Status of the ESCO industry

Subjects has to developed by the speakers

- Development of the ESCO industry
- Current status of the ESCO development
- Active ESCOs in the country
  - number of active and level of activities
  - Type of activities
  - Market sectors

*Speakers: (presentations of 20 minutes each, and 10 minutes questions period)*

Brazil: *Ricardo David - President of ABESCO \**

China: *Mr. Xu Fei, Secretary-General of EMCA \*\*\**

India: *Mr K S Sridharan, Chief General Manager, Indian Renewable Energy Development Agency (IREDA) Ltd. \**

11:45 Question and exchange period on the global development of the ESCO market in the three countries

12: 20 Summary of the morning session, Facilitator

*Speaker: Pierre Langlois, facilitator*

12:30 Lunch

14:00 The ESCO business, ESCO insights

Presentations from country ESCOs on there business models

- Focused market
- Type of contract used (shared savings, guaranteed savings, etc)

- How is the financing done
- Are guarantees offered
- Example of Project results (technical and financial
- benefits of the project (for the customer, for the ESCO)
- Example of successes and failures

*Speakers: (presentations of 15 minutes each, and 5 minutes question periods)*

Brazil: Mr. Ricardo David –, President- Ecoluz Consultores Associados Ltda  
Mr. José Starosta – General Manager - Ação Engenharia e Instalações Ltda.  
Mr. Oscar de Lima e Silva – General Manager – ACE – Agencia para Conservação de Energia S/C Ltda

China: Mr. Wang Hongying, General Manager, Hubei Sanhuan Development Co.\*\*  
Mr. Wu Daohong, President, Beijing Shenwu Thermal Tech. Co.\*  
Mr. Li Ting, President, Shenzhen Zhongcai Energy Management Service Co.\*\*

India: Mr Suresh Shah, Chairman & Managing Director, Asian Electronics Ltd  
Mr Laxmindra Mohan, Consultant, DSCL ESCo Ltd\*  
Mr Nalin Kanshal, Director(Business Development), Elrpo Energy Dimensions Pvt.Ltd

South Korea:

*Professor Suduk Kim, at the Department of Energy Studies, Ajou University*

15:30 Break

16:00 The ESCO business, ESCO insights (Continued session)

17:30 Summary and discussions, presentation of the Day 2 activities

*Speaker: Pierre Langlois, facilitator*

17:45 Closing Day 1

**DAY 2 APRIL 14<sup>TH</sup>**

9:00 Welcome, summary of Day 1 and introduction of Day 2

*Speaker: Pierre Langlois, facilitator*

9:10 ESCO marketing, a detailed analysis of some key challenges

- How ESCOs find their business opportunities
- What is the best approach to get a contract signed
- Are guarantees requested? How about Monitoring and Evaluation

Brazil: *Mr. Max Xavier Lins - Diretor de Clientes Corporativos – AES Eletropaulo*

*With the participation of:*

*Mr. Ricardo David – President- Ecoluz Consultores Associados Ltda.*

*Mr. José Starosta – General Manager - Ação Engenharia e Instalações Ltda.*

China: *Mrs. Sun Hong, General Manager, Shandong Province Energy Conservation Engineering Co. Ltd.*

*Mr. Liu Fang, Deputy General Manager, Beijing Yuanshen Energy Conservation Technology Co. Ltd.*

*Mr. Zeng Wu, President, CECIC-Blue-sky Investment Consulting & Managing Co.*

*Mr. Cai Jin, General Manager, Shanghai Shangliao Nengfa Energy Conservation Technology Co. Ltd.*

*Mr. Jiang Yuanfu, Executive Director, Beijing PowerU Technology Co.*

*Mr. Yu Tong,, General Manager, Tianjin Nengfa Weiye Energy Conservation Technology Co.*

India: *Mr. D Satya Kumar, Managing Director, Shri Shakti Alternative Energy Ltd*

*Mr R Kumar, DGM-Projects, Intesco Asia Ltd*

11:00 Break

11:20 ESCO marketing, a detailed analysis of some key challenges (Session continued)

12:20 Summary of the morning session

*Speaker: Pierre Langlois, facilitator*

12:30 Lunch

14:00 Equity financing for ESCO and ESCO Projects

Introduction and findings of international review

*Speaker: Bob Taylor, World Bank*

14:30 Presentation from each country

- Presentations based on ESCO equity financing reports prepared by each country

*Speakers: (country presentations of 20 minutes each, and 15 minutes question periods)*

China: *Mr. Jiang Yuanfu, Executive Director, Beijing PowerU Technology Co.  
Mr. Zeng Shangyou, General Manager, WB Project Dept.of China National Investment & Guarantee Co. Ltd.*

India: *Dr Koshy Cherail, Consultant to India Secretariat, 3CEE Project  
Mr Nalin Kanshal, Director, Elpro EDPL*

Brazil: *Mr. Pedro Magalhães - Investments Analyst - Rio Bravo Investimentos S/A  
Mr Maurício Esteves Marçal - Equity Fund manager - Rio Bravo Investimentos S/A*

15:30 Break

16:00 Presentation from each country (continued session)

16:30 Summary and discussions, orientation of the Day 3 activities

*Speaker: Pierre Langlois, facilitator*

16:45 Assignment to country team for break out session, results to be presented in Day 3

- What has been learned in this workshop and how it can be implemented in each country
- How to improve the ESCO business in each country (not focusing on the involvement of IFIs)

17:15 Closing Day 2

Evening Country break out session

**DAY 3 APRIL 15<sup>TH</sup>**

9:30 Special exchange session for ESCO Association

- Presentation by each Association on their activities, challenges, etc
- Exchange session between Association members

*Speakers: (presentations of 15 minutes each, and 15 minutes question periods)*

China: Mr. Chen Shuzhong, Deputy-Director of EMCA

Brazil: *Maria Cecília Amaral - Executive Director of ABESCO*

Notes: Other workshop participants can attend as observers  
*India Team Members will attend as Observers*

10:30 Welcome  
Summary of Day 2  
Introduction of Day 3

*Speaker: Pierre Langlois, facilitator*

10:40 Presentation on the assignment work by each country

*Speakers: (country presentations of 20 minutes each, and 10 minutes question periods)*

India: *Mr. K S Sridharan, Chief General Manager, IREDA*

Brazil: *Mr. Alan Poole – World Bank consultant and Brazilian team facilitator*

China: *Mr. Li Gang, President, Liaoning Province Energy Conservation Development Co., Ltd.*

11:40 Summary of the morning session

*Speaker: Pierre Langlois, facilitator*

12:00 Lunch

14:00 Synthesis of the cross exchange discussions  
Perspective

*Speakers*

*Pierre Langlois, facilitator*

*Open floor for participants*

14:30 closing remarks

*Speakers:*

*Mr. Wang Shumao, Executive Director of Project Management Office of WB/GEF China  
Energy Conservation Project*

*URC*

15:00 Closure