INTERNATIONAL FINANCE CORPORATION

IFC ENERGY SERVICE COMPANY MARKET ANALYSIS

FINAL REPORT, REVISED
- June 23, 2011 -

ECONOLER

ABBREVIATIONS AND ACRONYMS

ABESCO	**Brazilian Association of Energy Conservation Companies**
AEE	**Association of Energy Engineers**
ANEEL	**Agência Nacional de Energia Elétrica (Brazilian Electricity Regulatory Agency)**
ANME	**National Agency for Energy Management**
BBP	**Better Buildings Partnership**
BDO	**Banco de Oro**
BNDES	**Banco Nacional de Desenvolvimento Economico e Social (National Bank for Economic and Social Development)**
CEM	**Certified Energy Manager**
CGC	**Compagnie Générale de Chauffe**
CIDA	**Canadian International Development Agency**
CIPEC	**Canadian Industry Program for Energy Conservation**
CO2	**Carbon Dioxide**
COA	**Commission on Audit**
DBP	**Development Bank of the Philippines**
DSM	**Demand-Side Management**
EBRD	**European Bank for Reconstruction and Development**
ECM	**Energy Conservation Measure**
EE	**Energy Efficiency**
EESBA	**Egyptian Energy Service Business Association**
EEUCG	**Energy End-User Credit Guarantee**
EMCA	**Energy Management Company Association (China)**
EMC	**Energy Management Company (China)**
EPC	**Energy Performance Contracting**
ESCO	**Energy Service Company**
EVO	**Efficiency Valuation Organization**
FBI	**Federal Buildings Initiative**
FC	**Fundacíon Chile**
GC	**Gerens Capital S.A.**
GEF	**Global Environment Facility**
GHG	**Greenhouse Gas**
HBOR	**Croatia Development Bank**
HEECP	**Hungarian Energy Efficiency Co-Financing Programme**
HEP	**Hrvatska Elektroprivreda d.d. (Croatian State Utility)**

HEP ESCO	**Croatian State Utility Energy Service Company**
IEEFP	**International Energy Efficiency Financing Protocol**
IEPF	**Institut de l'énergie et de l'environnement de la Francophonie (Institute of Energy and Environment of the Francophonie)**
IFI	**International Financial Institution**
IGA	**Investment Grade Audit**
IPMVP	**International Performance Measurement and Verification Protocol**
IREDA	**Indian Renewable Energy Development Agency Ltd.**
IRR	**Internal Rate of Return**
LFI	**Local Financial Institution**
MOIE	**Ministry of Industry and Energy**
MUSH	**Municipal, Universities, Schools and Hospitals**
M&V	**Measurement and Verification**
NGO	**Non-Governmental Organization**
NRCAN	**National Resources Canada**
PCG	**Partial Credit Guarantee**
PHARE	**Poland and Hungary: Assistance for Restructuring their Economies**
PLDT	**Philippine Long Distance Telephone Company**
PPP	**Public-Private Partnership**
RE	**Renewable Energy**
RFP	**Request for Proposal**
RF	**Revolving Fund**
SEF	**Sustainable Energy Fund**
SG	**Savings Guarantee**
SME	**Small and Medium Enterprises**
SPE	**Special Purpose Entity**
TPF	**Third-Party Financing**
UkrESCO	**Ukraine Energy Service Company**
UNDP	**United Nations Development Programme**
USAID	**United States Agency for International Development**
WB	**World Bank**

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The present report was developed in the perspective of supporting IFC's effort in increasing its use of the Energy Performance Contracting (EPC) approach as a vehicle in the development of the Energy Efficiency (EE) market in developing countries.

The report first presents an introduction to the EPC concept and its models for IFC stakeholders, if needed. Furthermore, it focuses on a review of different approaches and opportunities that could be considered by IFC in the development of its activities using EPC.

A review of the current situation on the use of EPC is also provided for some countries in order to enhance understanding of the complexity involved in using EPC. The report also describes the successes and failures of a number of countries with the model. Such review is inevitably incomplete as EPC is used by private sector actors who do not want to provide information on their activities. Therefore, the reviews presented have been put forward based on the most recent publications on the subject, contacts with informed stakeholders and Econoler's own knowledge of these markets. A large portion of the detailed information on these markets is presented as appendixes so as to keep the main text of the report as concise as possible. However, the core information on the conclusion reached for each market is still presented in the main report.

We conclude the report by submitting recommendations to IFC on how it could benefit from the use of EPC to achieve its goals of fostering EE markets in developing countries. We also provide information on potential opportunities, either project- or corporation-related, for IFC to consider in its quest for new possibilities related to the use of EPC.

1 ESCO BASIC MODELS, CURRENT APPLICATIONS AND LESSONS LEARNED

1.1 ANALYSIS OF ESCO MODELS

1.1.1 Definitions and Basic Concepts

ESCOs develop, implement and provide or arrange financing for upfront EE investments for its clients. Repayments from savings allow clients to compensate ESCO's ongoing savings monitoring, Measurement & Verification (M&V) costs and assumption of risk through EPC or Third-Party Financing (TPF). The fundamental concept of the ESCO business model is that the client does not have to come up with any upfront capital investment and is only responsible for repaying the investment made or arranged by the ESCO.

The two dominant EPC models in the world are shared savings and guaranteed savings. In Europe, a third approach is used called "chauffage."

Shared-Savings EPC

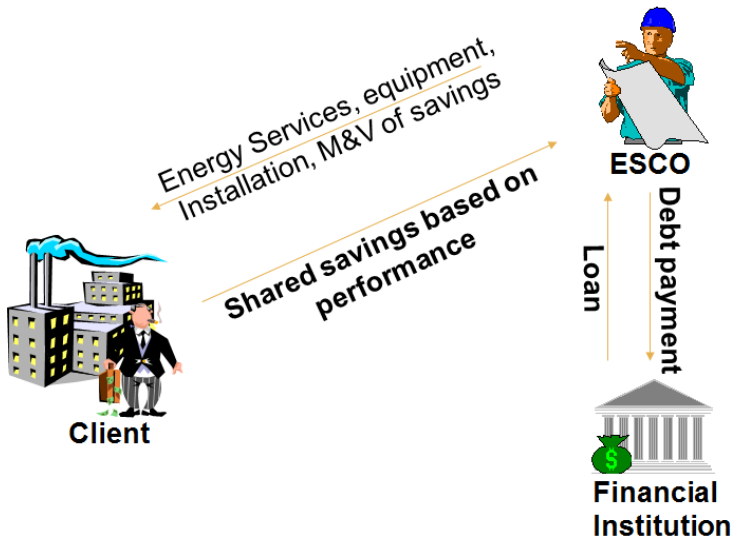

Figure 1: Shared-Savings Financial Model

In a shared-savings EPC, the ESCO finances the total upfront capital cost of the project and is totally responsible for repaying the lender. The client pays the ESCO a percentage (or it can be a fixed amount) of its achieved savings from the project, large enough for the ESCO to repay the project investment to its lenders, cover M&V costs and any other associated costs. The energy-end user assumes no direct contractual obligation to repay the lender, only the ESCO has this obligation.

Guaranteed Savings EPC

In a guaranteed savings EPC, the client essentially applies for a loan, finances the project and makes periodic debt service payments to a financial institution. The ESCO bears no direct contractual obligation to repay the lender, only the energy end-user assumes this obligation. The ESCO's guarantee is not a guarantee of payment to the lender but rather a guarantee of savings performance to the energy end-user that is usually equal to its repayments to the lender.

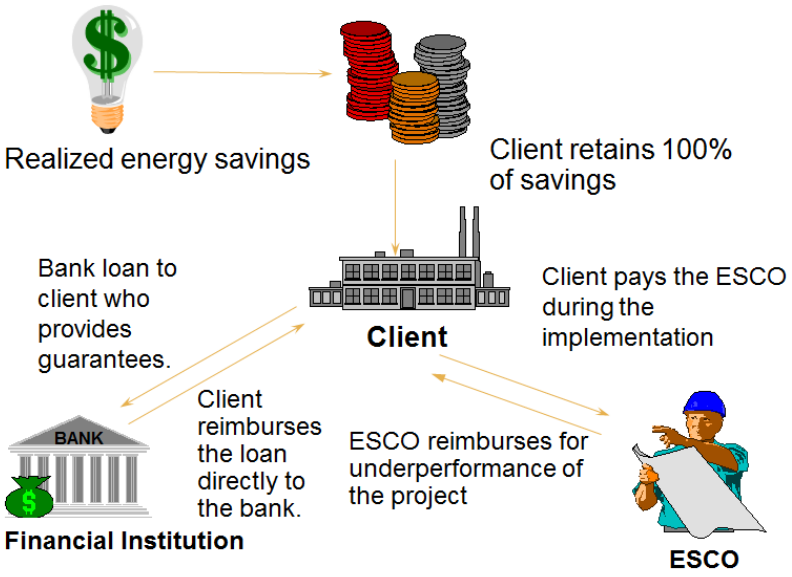

Figure 2: Guaranteed Savings Financial Model

"Chauffage"

"Chauffage" or integrated solutions generally refer to a greater value-added approach. The concept offers conditioned space at a specified price per energy unit to be consumed or per some measurable criteria (square footage, production unit, etc.) through a supply and demand contract offered by the ESCO. The ESCO manages all supply and demand efficiencies. This concept derives from a previous contractual French approach of energy services delivered by a private company to a public authority or to another private body (e.g., owner of aggregate properties) called "contrat d'exploitation de chauffage" leading to the wording "chauffage" to qualify this form of EPC. In the former French approach, the contract used to contain up to three elements designated under P1, P2 and P3, corresponding to the following services:

P1: Energy supply cost

P2: Maintenance cost

P3: Total guarantee cost (replacement cost of the equipment at the end of its life).

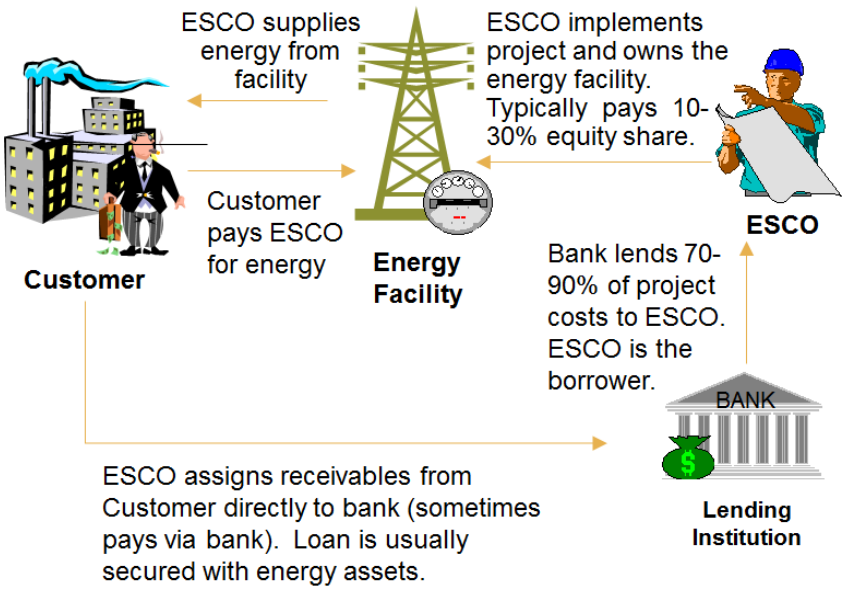

Figure 3: "Chauffage" Financial Model

Appendix 2 further details the ESCO and EPC concepts contrasting the different models and highlighting a few of the future model approaches. Appendix 3 outlines the essential critical success factors of ESCOs. A brief history of the ESCO industry illustrating a few cases of successful ESCO market development is found in Appendix 4.

1.1.2 Comparative Analysis of the Different Models[1]

The table below shows a comparison of the various performance contracting models along with three important questions.

Table 1: Energy Performance Contracting Models

Contract Type	Whose Balance Sheet?	Who Takes Performance Risk?	Project-Specific Financing?
Shared Savings	ESCO	ESCO	Yes
Guaranteed Savings	Customer	ESCO	Yes
"Chauffage"	ESCO	ESCO	No

* Note that ESCOs generally sell their right to receive payments from a project to other "third" parties as a means of recovering project investment and working capital to use in future projects.

1.2 LESSONS LEARNED FROM ESCO MARKETS

A brief history of the development of the ESCO market from selected countries is provided in Appendix 4 along with a summary of the lessons learned.

1.2.1 ESCO Market Review

1.2.2 Successful ESCO Market Development

It is difficult to isolate the exact reasons why a market has been more successful than another. Through two examples where the ESCO market has developed quite successfully, we can see that different factors lead to different types of successful markets.

[1] This section has been mainly taken from "A guide to Energy Service Companies" by Carry Bulock and George Caraghiaur.

Table 2: Success Factors in Canada and Croatia

LESSONS LEARNED	SPECIFIC CONDITIONS	
Success Factors	**Canada**	**Croatia**
Government support exists	Government-inspired solution to the oil crisis: The ESCO industry was strongly supported by the government with grants to immediate access to public facilities.	No institutional framework was set up to support the development of the ESCO industry.
Mature ESCO industry	The ESCO concept was launched in 1981 with only one ESCO. The market developed through a unique ESCO. Some initial competition started in the 1990s but it is only when the federal government launched a program dedicated to the use of the EPC model in federal buildings that competition really started to pave the way for a real ESCO industry.	Through a World Bank project, one utility-based ESCO was created and became over the years successful in various market segments.
Strategic industry focus	Focusing on the public sector and the commercial building sector minimized the associated risks in the ESCO business.	EE projects in public lighting and schools were simpler start-ups before diversifying to more complex sectors and technologies, mainly in bigger institutional buildings but also in some industries.
Financial access from (private) LFIs	Guarantees offered by the federal government made financing simple and easy to access for ESCOs. The use of the guaranteed savings approach, where the client is financing directly the project, has also contributed to the mitigation of the financing access barrier.	Financing for the utility-based ESCO was done first through a sovereign guarantee loan from the World Bank to the utility. Similar support was offered by the World Bank through a guarantee mechanism to the Development Bank of Croatia and a subsequent loan to the utility from KfW was also provided to support the growth of the ESCO.

1.2.3 Unsuccessful ESCO Market Development

It is on the other hand often easier to identify the main reasons for unsuccessful ESCO markets. By unsuccessful markets we do not necessarily mean markets that have no ESCO business but markets that are limited due to a myriad of reasons.

Tunisia

ESCOs were identified as key actors in developing a sustainable EE market in the industrial sector. Without a sound concept awareness program, developing even a small private ESCO industry becomes difficult. Lack of associated technical and financial tools hampers the start-up of an EE and ESCO market. The failure of bringing adapted financing mechanisms and excessive grants to stimulate the EE market became counterproductive in the development of an EPC market.

India

Improper public procurement can lead to counterproductive effects in the start-up of an ESCO market through the public sector, both for institutional actors and private ESCO players. The lack of good understanding of the added-value proposal offered by ESCOs prevented the concept to develop properly. Furthermore, the absence of a sound market at the institutional level prevented the wide development of the concept in the private sector through lack of good demonstration projects. On the other hand, all this did not prevent the development of EPC-based activities in different markets, although at a much smaller level than such huge potential could have yielded.

1.3 CHARACTERISTICS AND TYPES OF ESCOs

ESCOs are generally classified into the following four categories based on their composition and ownership:

- Independent ESCOs—ESCOs that are “independent” in the sense that they are not owned by an electric or gas utility, an equipment/controls manufacturer or an energy supply company. Many “independent” ESCOs concentrate on a few geographic markets and/or target specific client market segments.
- Building equipment manufacturers—ESCOs owned by building equipment or controls manufacturers. Many of these ESCOs have an extensive network of branch offices that provides a national (and international) footprint, with sales forces and specialized national staff providing packages of EE, renewables and distributed generation “solutions” to client market segments.
- Utility companies—ESCOs owned by regulated or state-owned electric or gas utilities. Many utility-owned ESCOs currently concentrate on regional markets or focus on the service territories of their parent utilities.
- Other energy/engineering companies—ESCOs owned by international oil/gas companies, non-regulated energy suppliers or large engineering firms.

On a limited scale, ESCOs can be differentiated on the basis of their marketing approach:

- Technology (boilers, controls, lighting, etc.)
- Sales approach
- Vertical market (schools, hospitals or steel plants, etc.)
- Utility supplier (electricity, heating/cooling or compressed air, etc.).

However, except for very large markets like the US and China, ESCOs rarely limit themselves to a narrow market in any country. It is rather the norm that ESCOs are more regionally focused than market focused.

1.4 SUCCESS DRIVERS

This section underlines two main success drivers based on our team's combined experience with ESCOs. We have indeed identified two drivers as predominant reasons why ESCOs have been successful. Appendix 5 further expounds these success drivers.

1.4.1 Market Credibility and Relationships

In nascent ESCO markets, having credibility and relationships with energy end-users is a key element for the trust needed for the end-users and ESCOs to be willing to enter into a new type of long-term contract that may have legal precedence. The critical factor in determining the creditworthiness of energy end-users is the ESCO's ability to convince an LFI for financing purposes.

The well-known macro-type barriers on which the ESCO has no control, such as the economic, political, legal and financial stability of a country, must be analyzed and deemed overcome in a satisfactory way before any reasonable level of EE can be pursued by ESCOs. For example, in countries where energy prices are subsidized, the ability to identify cost-effective EE projects will be almost impossible and therefore would not justify attempts for ESCO implementation. Similarly, local market conditions are often not conducive to LFIs being able or willing to offer commercially viable financing to EE projects.

In addition, in order to ensure a successful development of its activities, the ESCO needs to develop its own credibility and quickly expand its relationships with potential energy end-users. The possibility to hire locally high-level professional staff presenting the necessary skills corresponding to the ESCO's core business (energy auditing, EE engineering, financial engineering) has to be carefully investigated not only before the ESCO starts operating but also after. These skills are particularly specialized to the ESCO's performance-based business model and require individuals who are highly talented in the technical, financial and legal aspects of selling, structuring, financing and implementing energy savings projects.

Commercial skills are also paramount to develop quickly a network of contacts both in the public sector (national and local levels) and the private sector (through business associations, chambers of commerce, etc.) in order to enhance understanding and belief in the ESCO model, which may or may not be well-known and, in parallel, to negotiate EPC agreements with identified prospects.

1.4.2 Financial Capacity

Financial capacity is predominantly related to the ability to access commercially viable project financing. Project financing is so fundamental to the ESCO's business model that an ESCO cannot consider doing business in a country where it cannot obtain a long-term reliable source for financing its EE projects. However, the project financing barrier will normally be difficult to overcome for ESCOs when their financial capacity is limited due in large part to the fact that the local banking industry is unfamiliar and uncomfortable with providing project-based lending to energy savings projects on a medium- to long-term basis. Virtually few LFIs are willing to recognize and accept energy savings from EE projects as collateral.

The problem is compounded by the relative small transaction size of EE projects in relation to large independent power and Renewable Energy (RE) projects. The small transaction size is equated to a perceived small market size, which makes it difficult to convince an investor or a banker to invest the time and resources required to learn about a new lending product or service like financing EE projects. The learning curve is high due to the special financing intricacies of EE projects, which use the measured savings stream and general creditworthiness of energy end-users as collateral and basis for repayment versus traditional hard assets such as land and buildings.

It is very beneficial for an ESCO to start implementing its business model with sufficient equity to be able to self-finance a certain number of EE projects and start generating corporate cash flow. In addition, an adequate level of capitalization can help overcome the reluctance of LFIs to provide debt, especially if the ESCO can quickly demonstrate a track record of successfully implemented projects, and if the ESCO manages to concentrate its service activities on qualified energy end-users and short payback periods that can generate revenue streams quickly.

In summary, the financial capacity of an ESCO is an essential element of success, which can be gradually improved if the ESCO has been sufficiently capitalized to fund its initial EE projects and if prudent management of the project portfolio has occurred. This will provide convincing power vis-à-vis LFIs that there is potentially a large EE market to be tapped by them. The unwillingness of LFIs to recognize the increased credit capacity generated by the EE projects for energy end-users is caused primarily by LFIs not being familiar with EE projects and not having the internal capacity to properly evaluate the risks and benefits of EE projects. This unwillingness is a major contributor to the requirement for ESCOs to provide their own funding capacity for their initial EE projects.

1.5 ASSESSMENT OF NECESSARY ESCO DEVELOPMENT CONDITIONS

Our global experience indicates that ESCO industries essentially only flourish in markets where long-term "project-based" financing can be accessed on a local, affordable and reliable basis. This is critical because, as previously stated, project financing is a fundamental element to the core business model offered by ESCOs to ensure that energy end-users will not have to provide any upfront capital to implement the ESCOs' EE projects and will only repay the ESCO for the capital investment from

achieved savings. The term “project-based” means that the financing is totally supported (repaid) from the project, without reliance on any other revenue or repayment streams.

The ultimate environment for widespread implementation of EE projects by ESCOs is to have them financed with 100% debt for a medium- to long-term period and collateralized solely with the savings generated from the EE projects and related equipment installed. Financing based on 100% debt is the predominate method for ESCOs to finance their EE projects in the US because most of their customers are large creditworthy government entities, which offers very low credit risks to banks. This no-equity structure eliminates a significant barrier prevalent in most international markets to financing EE projects, which is to require ESCOs and/or energy end-users to invest substantial equity and/or put up business or personal assets as collateral for project-related loans. Investing equity or providing this additional collateral effectively reduces their credit capacity and, in the case of energy end-users, puts the EE projects in a category to compete with their core business investments, in which they rarely succeed.

While 100% debt is an ideal ESCO financing structure for fostering industry growth, it realistically cannot be applied to most developing and large international markets where repayment risk is much higher due to the majority of energy end-users being in private or commercial sectors that generally feature a much higher credit risk than do government entities. In addition, there are significantly greater risks associated with limited contract and legal enforceability, transparency of financial information and a list of other reasons common to developing markets. It is because of all these additional risks that lenders insist on having equity invested alongside their debt in EE projects implemented in developing countries or in facilities owned by private energy end-users.

1.5.1 Criteria for Successful ESCO Financing

In order for the financing of an ESCO business in a developing country (or anywhere else in the world) to be successful, it must address the needs of the four primary stakeholders in the marketplace – the ESCOs, investors, LFIs and energy end-users. These needs, provided below, become the criteria needed for the successful financing of the ESCO business.

ESCO Needs

The major elements of an ideal funding structure for ESCOs to be able to finance their EE projects and grow their industry in an IFC eligible country are:

- A majority of the ESCO’s project development, implementation and financing costs is provided upon completion of construction;
- No collateral is required from the ESCO beyond its un-securitized corporate guarantee and the EE project assets, comprising the residual value of the equipment installed and future cash flow streams from the savings generated;

- Construction (bridge) financing is made available as part of long-term financing typically secured by a construction bond from an insurance company*;
- Repayment term of at least seven years in addition to the construction period;
- Repayment is made in local currency;
- "All in" financing costs (including guarantee fees) do not exceed market interest rates;
- Reasonable credit terms and collateral requirements for "creditworthy" energy end-users;
- Consistent, competent and timely access to funding that will be sustained over a long period of time.

*It is important to note that the implementation phase of an EE project (the actual construction of the EE installation) is a critical phase of EPC. The financing of this phase has to be done through a construction loan (bridge financing), or less likely through the ESCO's own resources, or a combination of both. The risk for the lender is related to the timely completion of the installation and its accepted commissioning by the energy end-user. Many factors may have a negative impact on the project at this stage: costs underestimated, cost overruns, delays in construction or even ESCO bankruptcy. In order to mitigate these risks, the lender should take various securities, such as:

- Imposing the necessary insurance coverage for all aspects that can be properly insured;
- Making sure that the ESCO is managing the construction period under a turnkey contract involving reliable sub-contractors who provide the necessary and usual guarantees;
- Pledging the energy performance contract itself in order to take over with another ESCO, if needed.

Investor Needs

The major items needed to make EE projects attractive to investors are:

- Minimum 20% Internal Rate of Return (IRR) and manageable risks;
- Sufficient scale and standardization in investment evaluations and management;
- A viable "exit strategy" within a 5- to 10-year horizon.

LFI Requirements

The major elements required for LFIs to be willing to provide the above 'ideal' ESCO financing are as follows:

- Protection against non-payment of achieved EE project savings by end-users;
- Protection against the performance risks of EE projects not generating sufficient savings to energy end-users to enable the project to pay debt service.

Client Needs

The major items needed to make EE projects attractive to energy end-users are:

- Limited negative impact on their existing credit capacity or capital budgets;
- Limited resources and efforts required from them;
- Simplicity in consummating the transaction;
- An ongoing positive cash flow from the EE projects, or in the worst case scenario, no out-of-pocket cost;
- Market IRR and ESCO commercial terms.

1.5.2 Project-based Debt Facility Operating Characteristics

The following basic structural, operational and management characteristics are needed in a financing facility that is interested in getting seriously involved in EE and EPC projects:

- Clearly defined project qualification criteria;
- Clearly understood approval process and documentation requirements;
- Standardized terms, conditions and documents;
- Easy access through local channels or intermediaries (designated lenders);
- Competent and knowledgeable lending staff of designated lenders who are able to evaluate the risks and benefits of EE projects and have experience in offering non-conventional loans;
- Quick approval (or disapproval) process that takes no more than 30 days;
- Minimum administrative effort required after initial learning curve;
- Centralized training program to certify staff of designated lenders.

In addition to these, the most important thing is that the ESCOs must have total confidence that the financing facility will be reliable, consistently applied and sustained over a relatively long period of time. This is critical for ESCOs to be able to offer financing that uses the facility to its energy end-users.

1.6 EPC IMPLEMENTATION ANALYSIS

Below is a discussion of the major EPC financing mechanisms and business models that have succeeded in developing countries and the primary reason for their success.

1.6.1 Financing Mechanisms

The only real financing mechanism that has been successfully used by ESCOs to build a sustainable EPC business is a project-based funding mechanism where all or a majority of the credit risks of facility owners (where the EE projects are installed) are assumed by entities other than the ESCO. The reason for the success of this project-based funding mechanism is that it allows ESCOs to focus

on their core energy services business from both an operating and corporate funding perspective. They are not required to continually have to raise substantial amounts of corporate capital resulting in substantial ownership dilution that would otherwise be needed for equity investment and collateral to secure debt for their EE projects. It prevents them from having to become banks or large leasing companies with a great number of assets, debt and equity on their balance sheets and high credit risk exposure.

Another significant benefit of having independent funders is that it allows the ESCOs to realize construction revenues, profits and cash flows upon construction completion versus having to realize them over a five- to seven-year period through savings.

1.6.2 Business Revenue Models

Shared savings is the primary ESCO business model that has succeeded in IFC eligible countries. As stated in Section 1.1.2, the shared-savings model is a success in IFC eligible countries because the ESCO business is not well known to energy end-users and requires them to assume virtually no risk. Consequently, it is easier for ESCOs to sell EE projects to energy end-users when they are not required to invest any capital or assume any obligations and are only required to pay from future savings. This model also does not require energy end-users to assume any technical risk. Moreover, as critically important to industrial energy end-users, it does not impair or reduce their credit capacity for use in their core business.

The guaranteed savings model is mostly used by ESCOs in North America, where most EPC energy end-users are government entities willing to incur debt to pay third parties that can then access low-cost financing for 100% of the project. However, as previously stated, this model realistically cannot be applied to most developing and large international markets where the repayment risk is much higher due to the majority of energy end-users being in private or commercial sectors that generally feature a much higher credit risk than do government entities. In analyzing the financing mechanisms that are used by ESCOs to fund their EE projects in large US and Canadian ESCO industries, the following core elements can be outlined:

- ESCOs do not assume any energy end-user credit risk;
- Project funding is not provided by the ESCO but by independent entities;
- In addition to performance guarantees, ESCOs only provide project assets and cash flows to project funders as collateral and no other “hard” collateral is required.

The “chauffage” model is limited in applications but works well in IFC eligible countries of Central and Eastern Europe in the context of municipal district heating plants where a lot of heating (or alternatively cooling) loads are present. It features the same benefit for energy end-users as in the case of the shared-savings model whereby they are not required to invest any capital or assume any obligations, they rather pay from future savings.

1.6.3 Partly Successful Initiatives

Brazil[2]

Before 2000, there had been almost no encouragement in EE except for utility Demand-Side Management (DSM) programs that had been regulated by legislation that year. Utility DSM programs make a big single market for ESCOs in Brazil. The energy efficiency program under the DSM policy stipulated that utilities had to spend a percentage of their revenue on EE projects. Additionally, the presidential decree in 2000 required that all federal buildings reduce their electricity consumption by 20% within two years. In the midst of the 2001 energy crisis, the government showed considerable interest in developing a long-term and "market-oriented" EE policy. This was the first energy policy ever where the Brazilian government explicitly recognized the potential importance of EE services. Government promotion of ESCO services is a key element in a long-term EE policy. Today there are approximately 75 companies listed as ESCOs with the Brazilian Association of Energy Conservation Companies (ABESCO). Within a core group of eight ESCOs, only four assume financial risks related to savings performance at a level equal or near to the capital cost incurred to implement the EE project and have experience with the financial structuring of projects. Despite partial success in developing the ESCO market, barriers remain. Among others, Brazilian ESCOs consider the lack of access to competitive financing as a major impediment to concluding EE projects. More barriers and historical accounts of ESCOs are found in Appendix 6.

China[3]

From 1997 through June 2006, the three state ESCOs had invested USD 181 million in EPC projects [4]. According to published results, the WB's program goals to introduce, demonstrate and disseminate the advanced market-oriented energy conservation mechanism referred to as "Contract Energy Management" (same as EPC) and strengthen the effective dissemination of energy conservation information in China were accomplished. From a performance contracting industry perspective, the program successfully introduced and promoted ESCOs and their savings-based business model. The ESCO industry in China is fully endorsed and supported by the National government. Today, there are over 600 ESCOs (called Energy Management Companies (EMCs) in China) promoting the shared-savings business model to prospective energy end-users in the PRC. Despite the marketing success (in numbers) of EMCs in China, they have little or no ability to finance their EE projects, which has resulted in a large backlog of EE projects to be funded within the Chinese ESCO industry. While the number of Chinese ESCOs and project investments have grown rapidly in recent years, the industry as a whole comprises many SMEs that are severely capital constrained causing a severe "funding gap" for the ESCO industry. EPC in China has not followed the traditional shared-savings models

[2] S. Hansen, P. Langlois and P. Bertoldi, "South America", ESCOs Around the World, 2009, Chapter 8.
[3] Partly taken from S. Hansen, P. Langlois and P. Bertoldi, "Asia," ESCOs Around the World, 2009, Chapter 6.
[4] World Bank, China Energy Conservation Project Implementation Completion Report (World Bank, 2007).

defined earlier as commonly used in North America and other countries. Energy end-user payments under the Chinese shared-savings scheme have been stipulated in the contract and ESCOs have incurred no performance risk. In general, a major future EPC barrier in China will be the need for ESCOs to assume performance risks and have payments measured and verified if they want to achieve their targeted profits. Chinese ESCOs are also generally facing barriers concerning financing, taxation, payment terms and marketing. More ESCO barriers are listed in Appendix 7.

The EE and ESCO investment opportunity in China is huge due to the large number of very inefficient large-scale industrial processes, and more importantly, national policies favoring ESCOs and targeting EE as one of the cleanest, most cost-effective and potentially largest “sources” of new energy. These policies have filtered down to local levels, placing mandates on state-owned end users as well as provincial and local governments to achieve the central government’s long-term EE and emission reductions plans, which include the following:

China’s 11th 5-year plan had provisions to reduce energy consumption and Greenhouse Gas (GHG) emissions by 20% through 2010 versus 2005 levels.

China’s 12th 5-year plan contains a commitment to actively respond to climate change by dramatically reducing energy consumption and carbon emissions. Additionally, to strengthen and improve energy savings goal responsibility, many actions have been taken including: (i) appraisal regulations and standards, (ii) market mechanisms and energy for enterprise's encouragement to implement key energy-saving projects, (iii) popularize advanced energy-saving technology and products, and (iv) accelerate energy contract management, etc. Its national targets are:**Energy Intensity Reductions**

- 16% by 2015 vs. 2010
- 31% by 2020 vs. 2010

Carbon Intensity Reductions

- 40% carbon intensity reduction by 2020 vs. 2005
- 17% energy emissions reduction by 2015 vs. 2010.

China’s Medium- and Long-term Energy Conservation Plan from 2003 to 2020 has set EE improvement targets that amount to reductions of 1.4 billion metric tons of coal equivalent and air emissions of 3.5 billion metric tons of CO2 equivalent.

In 2010, the PRC national government adopted favorable national tax legislations for ESCOs that implement EE projects on a paid-from-savings basis, including:

- Business tax and value added tax exemption for ESCOs;
- Exemption for the first three years and half tax for the next three years of income tax for ESCOs;
- Expenses for energy saving services can be deducted before tax for the client;
- Assets transferred to clients after the service period can be treated as full depreciation or amortization and are not included in the income of ESCOs.

Other factors that will accelerate growth in the EE market include the following:

- China's energy consumption per unit of GDP is between 20-100% higher than the levels in industrialized nations while consumption of electricity per unit of capital lags well behind.
- Continued improvements to the standards of living is leading to China's urbanization plan to construct many new cities that will demand a significant level of additional energy resources, placing even greater pressure to maximize the efficient and clean use of scarce energy resources.

China spent over USD$53 billion in new 'clean energy' investments in 2010 versus $36 Billion in Europe and USD$29 billion in the U.S. with nearly 98% of these investments in renewables, predominantly wind.

Most Chinese ESCOs are small SMEs, single technology manufacturers or service providers with access to a large number of potential EE projects that they cannot implement due to limited financial capacity, limited industrial EE technical experience (beyond their single technology) and virtually no project-based financing experience, which results in significant backlog of EE projects for Chinese ESCOs.

Most of them also have little or no ability to finance their larger EE projects, which has resulted in a significant backlog of EE projects to be funded. This funding gap has been caused by the shared-savings business model offered to energy end-users whereby ESCOs fund all required upfront capital for the "turnkey" installation of EE projects and receive their long-term repayment (5+ years) from energy end-users as savings are achieved from the EE projects. As in similar countries, the primary sources for Chinese ESCOs to finance their large EE projects are: 1) 100% equity from third-party investors and/or 2) long-term debt from local lenders who require at least 30% equity and liquid collateral equal to or exceeding the loan amount. As a result, there is a significant backlog of EE projects for most Chinese ESCOs.

In order to fully capture the abovementioned backlog opportunity, another ESCO industry gap needs to be addressed (technical gap) caused by limited energy engineering, deal structuring and project financing skills. Filling this gap will increase the scope of technologies implemented in EE projects, and result in more savings and a larger investment.

While the investment opportunity in the Chinese EE market is difficult to document, there is a general consensus that it is enormous with estimates in excess of USD 100 billion. Local ESCOs are well positioned to be the leading service providers of that market if the financing and technical gaps for the Chinese ESCO industry are filled.

Côte d'Ivoire[5]

The development of the ESCO industry in Côte d'Ivoire called for seed capital to demonstrate the feasibility of the EE concept. The Institute of Energy and Environment of the Francophonie (IEPF), acting as the ESCO project executing agency, set up a Revolving Fund (RF) of USD 200,000. This RF was used to finance EE investments proposed by an ESCO under an EPC approach. The most common models used in Côte d'Ivoire are guaranteed savings and shared-savings contracts. Upon completion of the ESCO market development project, the remaining resources in the Revolving Fund were used by the Ivorian National Investment Bank to set up a guarantee fund. Despite the partial success of the development of an ESCO market in the country, the two main obstacles remain to be the lack of financing (from LFIs) and the absence of qualified entrepreneurs in the EE sector to support the EPC approach through third-party investment. The previous EE projects showed that new approaches, such as ESCOs, are needed to extend EE services into the industrial and commercial sectors. Additional historical accounts of the country's EPC and ESCO industry is found in Appendix 8.

It is to be noted that all efforts to continue to develop this small but innovative market were stopped and the market collapsed in the years 2000 due to the unstable political situation.

Hungary[6]

The development of the Hungarian ESCO industry has been celebrated as a unique success story not only in Central Europe but also across the EU. Based on a registry of the Energy Center, there are about 30 ESCOs or ESCO-type companies in Hungary with five or six companies covering 80% of the EE market. Projects in the beginning were primarily focused on public lighting, cogeneration and district heating system improvements. Recently, other technologies have been gaining increasing importance, such as heating and hot water system interventions, industrial water and steam supply, air conditioning, automation and biomass. Most of the energy end-users have been in the municipal sector. The industrial sector EE activity has increased but barriers continue to impede EE expansion to the residential sector. Appendix 9 outlines the other relevant barriers presently faced by the ESCO industry in Hungary.

1.6.4 Failure Cases

Egypt[7]

The development of the ESCO industry in Egypt has been sluggish since the late 1990s when the ESCO concept was initially introduced through projects funded by the United States Agency for International Development (USAID) and the United Nations Development Programme (UNDP). The

[5] S. Hansen, P. Langlois and P. Bertoldi, "Africa," ESCOs Around the World, 2009, Chapter 4.
[6] S. Hansen, P. Langlois and P. Bertoldi, "Eastern Europe," ESCOs Around the World, 2009, Chapter 3.
[7] S. Hansen, P. Langlois and P. Bertoldi, "Middle East," ESCOs Around the World, 2009, Chapter 5.

Egyptian Energy Service Business Association (EESBA) membership is limited to only about a dozen consulting firms and companies providing EE product supplies and services. Out of 19 identified large ESCOs, no one offers EPC. Currently, there are no M&V protocols being used. Absorbing the financial and technical risks is not provided by ESCOs due to the market's unwillingness to pay for the associated premium. Appendix 10 presents other barriers to EPC and ESCO market development.

Philippines[8]

The Philippine government focuses its efforts on conserving energy only when oil prices are soaring high. When fuel costs begin to normalize, commitment to EE activities slows down. Energy end-users in the Philippines are generally not willing to pay for the premium associated with the ESCOs' risks. Energy end-users typically "shop around" for alternative proposals from other entities (usually product suppliers) without regard to the specialized and unique services of ESCOs (i.e., IGA, M&V, energy savings guarantees). In the Philippines, fee-for-service ESCO contracts remain popular. This type of service is typically an engineering consulting engagement wherein the client procures EE equipment through a standard bidding process. To date, few ESCOs have been able to transact EPC projects in the Philippines. Local ESCOs do not have the real capability to conduct Investment Grade Audits (IGAs) and/or M&V. Many local ESCOs do not value IGAs and M&V. In addition, local ESCOs lack the necessary marketing and negotiating skills to conclude a fair EPC transaction. Appendix 11 expounds the country's ESCO market and EPC development further.

Ukraine[9]

Ukraine is a country of transition economy where the ESCO industry has been progressing sluggishly with relatively few EPC initiatives. Energy prices in Ukraine are often subsidized to varying extents. Consequently, EE projects are often very difficult to finance, much more to develop and implement. Most EE companies working in Ukraine do not necessarily adopt the EPC concept, nor do they provide financing for EE projects. Some foreign ESCOs also attempted to enter the country's ESCO industry. Nonetheless, none of these ESCOs were able to provide the full range of EE services of a typically defined ESCO. The Ukrainian government has played a major role in developing the Ukrainian Energy Service Company (UkrESCO), a state-owned joint stock ESCO. However, there have been no large projects that trained local specialists on EPC. One of the most crucial obstacles in Ukraine is the scarce information and awareness about ESCOs, the EPC concepts and the opportunities underlying in EE investments. Furthermore, access to adapted financing for local ESCOs has been lacking for many reasons. Other barriers are detailed in Appendix 12.

[8] S. Hansen, P. Langlois and P. Bertoldi, "Asia," ESCOs Around the World, 2009, Chapter 6.
[9] M. Evans, Tapping the Potential for Energy Efficiency: The Role of ESCOs in the Czech Republic, Ukraine and Russia, 2000.

1.7 MARKET SUPPORT ASSESSMENT

It is not an easy thing to support the development and implementation of EE projects through the use of EPC in any country, even more so in nations with economies in transition. As IFC is looking to use the EPC concept as a vehicle to increase its capacity to implement EE projects and not to develop an EPC market as such, a few basic elements have to be considered before even thinking of developing such projects in any given country.

- There is a fundamental need to have capacities or access capacities to develop and implement EE in a specific country. Without such capacity, the use of EPC will not be possible.
- The project considered has to be in a country where the legal system is functioning well. The full value of an EPC project resides in the positive cash flow generated by a project and the commitment of the energy end-user to pay the ESCO on a long-term basis (or to have the ESCO reimburse the energy end-user in case of default on the project objective). As a result, the risk taken to invest in a project where there is risk in enforcing a contractual arrangement cannot be sustained in the absence of an adequate legal system.
- The EPC concept has to be introduced somehow in the country. Without such previous knowledge, the cost to develop a first transaction is likely to be too high for IFC as its goal is not to introduce the concept but to use it to generate a significant impact within an acceptable timeframe.

As a general and commonly agreed observation, it can be said that the ESCO concept has not developed as expected around the world considering the advantages that it theoretically entails and provides to both public and private energy end-users. Although critical ESCO success factors have previously been analyzed, this section will put emphasis on the various types of measures that could be contemplated by IFC in order to be able to use efficiently the ESCO concept and increase its activities in the EE sector.

1.7.1 Private & Public Energy End-Users

Beyond the characteristics of the various offers intended for players in markets where IFC could get involved, the common interest of potential energy end-users is to reduce operational costs while limiting their investment or obtaining a result guarantee related to their own investment.

As these EE projects often generate marginal benefits to beneficiaries compared to their more global operations, it is fundamental that the process to develop an EPC approach and to sign a contract not be seen as too complex.

Therefore, IFC would need to make sure that its proposed structure with the ESCO or the energy end-user is not perceived as too painstaking. In that sense, it would be logical to enter a market where ESCOs are currently present and where deals are implemented under a demonstrated approach. This would simplify things for IFC in its quest to use EPC as a vehicle for EE project implementation.

1.7.2 Financial Institutions

Undoubtedly, issues related to the financing of projects and to the materialization of the energy saving guarantee, if need be, are the major stumbling blocks, that have, so far, hindered the development of ESCOs. The incapacity of LFIs to consider ESCOs as viable clients and EPC as a credible concept certainly opens interesting opportunities for IFC to act as a catalyst for such a market. Indeed IFC would greatly benefit from supporting LFIs in their involvement in such schemes or, if the project size allows it, in their direct involvement in a transaction set up in a specific country.

In terms of support to LFIs as an opportunity to finance project implementation through EPC, IFC can play a decisive role in easing the judgment of financial institutions regarding the creditworthiness of an ESCO that usually depends only on its equity level relative to its financial commitments.

How the ESCO would be able to face such a situation is the key question from a credit risk analysis perspective. While this question prevails in all cases, it is even more aggravated when the ESCO has adopted a model in the past by which it directly provides financing of the investment instead of arranging it through a financial institution, yet still retaining the client's credit risk and having a loan on its books that deteriorates its financial capacity.

As it is well known, what is different in an ESCO scheme is that the ESCO is providing a financial guarantee that, in the worst case, could be equal to the total cost of the investment. In that sense, the ESCO would normally provide this additional guarantee to LFIs for their consideration. Consequently, IFC can provide expertise and guarantees to LFIs to maximize the approval of loans for good EE projects with schemes already used in the past.

In order to cope with these issues, two possibilities can be contemplated by IFC in trying to use such an approach in various markets:

1. IFC can finance a specific project to be implemented under an EPC approach through an LFI (or directly) as long as the ESCO can access the level of equity required by the nature of its financial commitments. This can be the case if the ESCO is the subsidiary of a large industrial group or of a large utility willing to support development by providing the necessary financial guarantees. Such a situation can also be found when the ESCO is created or supported by a dedicated equity fund (but then, the terms of the fund have to be designed in a way which allows investing up to a level of 100% in the capital of a company, which is usually not what is accepted by investors). In all cases, the main question is how and when will the ESCO be able to leverage enough debt compared to its initial equity basis to ensure a reasonable IRR. The ESCO projects to be financed by LFIs through an IFC technical and financial support program develop a business model focused on relatively small and similar types of projects and, on this basis, negotiate with a bank a credit line or a facility which can be tapped, under certain conditions, in a smooth, quick and transparent process. In such an approach, the LFI could accept to take into consideration the actual project pipeline of the ESCO as collateral and not just its balance sheet.

2. The creation of a guarantee facility to support LFIs in their lending activities to ESCOs or EE projects. Such guarantee could be provided on a fee-based approach or a partial counter guarantee from the ESCO, or the EE project itself. As in the case of most guarantee or insurance schemes, the difficulty lies in the application of the guarantee modalities and the related transaction cost. This, in turn, may lead to charging a premium to the ESCO and render the operation or the EE project non-cost-effective. In addition, the question would have to be raised as how this facility will be constituted since a purely private scheme does not look likely.

1.7.3 ESCOs

As indicated in 1.7.1, in some countries, ESCOs are looking for some form of recognition through the creation of an institutional framework under the form of private associations organizing seminars, workshops, publications and developing other communication tools. Other countries may decide to go even further by creating specific "ESCO laws," as presently under discussion in Russia.

Such laws can potentially include certification procedures as previously referred to but often take measures to make the application of procurement rules in the public sector easier by adapting some of the current obligations, with a view to taking into account the specificities of the ESCO approach. This is very important because the public sector, by giving the example of using the ESCO model, is creating a de facto market for existing ESCOs and helps trigger the emergence of new ESCOs. The energy audit issue is of particular relevance in this context as it is the basis for an ESCO offer: public procurement rules should integrate the fact that ESCOs need to carry out these energy audits by themselves as they cannot run the risk of providing a guarantee on data which origin is unknown but they cannot run the risk of carrying audits for a large number of buildings (which is often the case in the public sector) without being compensated if they do not win the tender.

The intervention of ESCOs in the private sector does not usually entail the same issues but a certification process (including the certification as energy auditors) of the ESCO staff would be of great help.

Based on the previous points, IFC should consider entering into deals in countries where ESCOs are present and where there is either some kind of market recognition for their services or some kind of a demand triggered by conditions in the market (such as a public scheme for the use of ESCOs).

1.7.4 Concessional Finance Assessment Required to Catalyze the ESCO Market

The question of whether concessional finance is necessary (or could be used by IFC) to catalyze the ESCO market has often been raised. Regardless of the source of concessional finance, it would certainly be a powerful instrument to foster the EE market and, by default, ESCOs and their operation. However, concessional financing would be of interest as it could lead to reducing the contract duration but would not sort out the main issue in terms of needed collateral and the lack of a sufficient level of equity. In addition, giving ESCOs the possibility to access concessional finance may raise issues in

terms of market distortion (competition with other LFIs or what would happen when such concessional financing ends).

More generally, and coming back to the idea developed in the previous section regarding the setting up of an ESCO equity fund, it is clear that such an initiative could be largely strengthened if it was possible to support it with a debt facility structured with at least a part of concessional finance. It would be an additional advantage in the framework of this global suggested mechanism and also an advantage for IFC as it would open the door to participating in this equity facility alongside other lenders, including concessional finance.

1.8 HIGH GROWTH/IMPACT ESCO MARKETS IN IFC ELIGIBLE COUNTRIES

1.8.1 ESCO Market Geographic Location

At the present time, ESCOs seem to be emerging in an impressive number of countries around the world. This is due to the increasing awareness and the important efforts developed worldwide related to the EE sector. On the other hand, the definition of what an ESCO is in each of the different countries and regions can be quite different and we could say that in most countries real ESCOs are not present.

Africa

The ESCO market in Africa is almost non-existent, except for some very limited activities in the northern region (Tunisia mainly with limited success) and even less in South Africa. It should not be a focus of IFC under the present initiative.

Asia

Asia is certainly the fastest growing region as far as ESCO operations are concerned. The increasing activities in China and India, and the important size of their market, are the most important factors for this situation. ESCOs are also active at a smaller level in other countries with limited success. Exceptions like Thailand can be mentioned but cannot be compared in scale to the markets of China and India. Unfortunately, the lack of involvement of the government to provide access to public sector facilities has been limiting this incredible potential for ESCOs in these countries. The markets in Central Asia are on the other hand very limited if not non-existent in most countries.

Central and Eastern Europe

It would be obvious to say that ESCOs are the most active in Central and Eastern European countries because of the long experience of trying to develop this concept in these markets, high energy costs (or increasing ones), the high energy intensity and the presence of EE financing supported by different IFIs such as the European Bank for Reconstruction and Development (EBRD) and the World Bank.

Latin America and the Caribbean

The market in Latin America is growing in a very uneven way. Brazil has been leading the way for many years, due to the size of its market and the presence of many initiatives to develop and promote the concept. The lack of institutional framework to allow access to public facilities for ESCOs has been an important barrier to the wide development of the market. Mexico has seen some ESCO activities and Uruguay has launched a utility-based public ESCO facility (supported by the World bank under a similar approach to the one taken in Croatia). But in most other countries, the presence of ESCOs goes from very limited to non-existent.

Middle East

ESCOs have been present in this region of the world since the early 1990s. The market remains limited and the unstable political situation in most countries has prevented a true development of the market. Jordan and Lebanon, through different initiatives, have seen some ESCO development opportunities and some international players have shown interest in these markets, competing with small local ESCOs. On the other hand, the market remains limited and small and should likely not represent a priority for IFC.

1.8.2 ESCO Market by Industry/Client Category

It is not the practice of ESCOs to be specialized by industry or market category. Even in the best developed markets of North America and the EU, ESCOs usually focus on buildings of all types as well as, at a lesser level, on different industrial sectors.

The reasons for such a situation are as follows:

- In most countries, the ESCO market is small so ESCOs have to be very flexible to adapt to any kind of opportunities.
- In most countries where the market is well developed, it is essentially driven by the public sector, so often highly concentrated in buildings of all types (office buildings, recreational facilities, etc.), water pumping facilities and street lighting.
- The industrial sector is more reluctant to work with ESCOs for many reasons, including the fact that EE projects are seen as having too long payback periods and that ESCOs are not recognized as specialists in their specific production sector.

- ESCOs have to develop very specific knowledge in the specific legal, institutional and financial environments in which they work. Developing a core business in a specific sector that could be implemented in several countries is very difficult and transaction costs would increase tremendously, among others.

For all these reasons, we are not able to provide IFC with a list of ESCOs that would focus specifically on any specific market or sector. On the other hand, we can confirm that all international ESCOs focus on public sector facilities (as described above) as well as on private sector buildings. In the industrial sector, some of them are active but mainly focus on non-process EE opportunities that are more related to building operations (heating, cooling, motors, etc.) than anything else.

1.8.3 Emerging ESCO Markets

It is an important challenge to identify the countries where the ESCO market is really developing as such market is often not well understood since, when not in public facilities, it is essentially developed on a private basis known by EE market stakeholders. To the best of our knowledge, the following countries are the ones where the ESCO market is currently best established, even though deficient in many aspects:

- Brazil
- Czech Republic
- China
- India
- Hungary.

Most of these countries are qualified as emerging markets since the market is far from fully developed even though many ESCOs are present and active.

At another level of development, we could qualify the following countries as emerging markets, in the sense that even though there are limited ESCO activities, actions have been or are currently under development to help support the creation of such a market:

- Chile
- Thailand
- Ukraine
- Russia.

1.9 KEY SECTORS AND TECHNOLOGIES

As shown in previous activities, the sector that has been the bread and butter of ESCO activities in all developed markets has been the public building sector. For those ESCOs that are providing both the technical EE expertise and direct financing of the project, it is undoubtedly the most interesting market, because the credit risk is reduced as compared to the industrial sector and, quite often, the ESCO can genuinely play its "aggregating" role through addressing a number of buildings under the same EPC agreement, while designing investments that in essence are somewhat similar. For instance, the first TPF company created in France in 1984 signed EPC agreements with local authorities (regions) for the EE refurbishment of tranches of 50 high schools. Because of these characteristics, ESCOs can specialize activities in this public building sector without taking the risk of undermining their activities through a too concentrated focus. However, for this particular segment of the EE market to be attractive for ESCOs, the following conditions have to be fulfilled:

- A legal status for EPC agreements at country level that makes their approval possible by public decision makers at the administrative level;
- An incentivizing regulatory framework both in terms of non-subsidized energy tariffs billed to the public sector associated with an obligation to pay these bills through enforcement measures, and in terms of removing artificial barriers erected sometimes by the energy regulators that prevent public organizations from benefitting from the savings which they achieve (e.g., the cost plus fee structure imposed to district heating companies in Eastern Europe).
- The capacity of ESCOs to provide a full service, including technical design and implementation and direct financing. Direct financing of the operation by ESCOs in the public building sector is one of the most attractive components of the proposal in many countries as it allows the designated public entity to "implement cost savings projects without directly borrowing" and to virtually make a transfer from the investment budget to the operation budget in the framework of what can be considered as a Public-Private Partnership (PPP). This however refers back to the ESCO creditworthiness and its ability to attract debt at a sufficient level on its books to be able to finance the identified projects.

IFC could be instrumental in removing or mitigating these barriers. Although energy end-users in this segment of the EE market are public sector entities, supporting deals based on PPP approaches through interventions targeted towards the private sector should be in line with IFC's strategy. This would imply providing capacity building, advisory services and technical assistance directed to the setting-up of an ESCO enabling environment at country level, as well as developing adapted financial mechanisms to help ESCOs overcome the financial hurdles. On this last point, lending directly to a local ESCO specializing its activities in the public building sector, under the form of a credit line, might be a reasonable option for IFC, considering that:

- In the public building sector, a project portfolio approach is possible (a large number of buildings can be bundled under a unique or several similar energy performance contracts) leading to requesting from the financial institutions relatively large amounts of debt finance, which can be compatible with IFC rules and procedures.
- The high rate of investment duplicability (depending on the kind of buildings – e.g., schools, hospitals, municipal buildings, barracks, etc.) that allows to base investment decisions on a proven track record, as well as the public nature of the energy end-user, play a risk mitigating role. Therefore, the main risk for IFC would be the ESCO credit risk.

ESCO deals in the public building sector would generally result in longer-term contracts than in the industrial sector, and therefore would require longer maturity loans. Such a constraint can be better accommodated by IFC than by LFIs (this however might be an issue to analyze more thoroughly when it comes to syndicating the loans in order to also meet the thresholds in terms of percentage of the total investment cost financed). Finally, what might be the main difficulty is the currency issue and whether the ESCO can take the exchange risk, although in relatively frequent cases, part of the equipment has to be imported and paid in hard currency. However, we believe that IFC is used to dealing with the exchange risk issue and can develop appropriate mechanisms that could also work in the ESCO context. In any case, developing an EE strategy in the public building sector, through support to private ESCOs (existing or to trigger and create), looks reasonable at least in geographic areas where the energy savings potential is attractive: Eastern Europe, Central Asia, China, North Africa, etc.

1.9.1 Sectoral Analysis

Apart from the case of the public building sector, over the last 30 years ESCOs have not been tempted by sectoral approaches, based on some kind of specialization in specific industrial sectors. There are various reasons for this, the most obvious being the research of a diversified portfolio and as a consequence reluctance vis-à-vis an approach that would concentrate the risks in one particular sector. This is especially true for ESCOs financing investments directly under EPC agreements, but it applies as well when the ESCO is looking for LFIs to provide finance to energy end-users, unless the ESCO is able to find different LFIs for the various deals and afford the corresponding increase in transaction costs. Another reason that limits the interest of developing sectoral ESCOs is related to the fact that, because of the legal issues and specificities of EPC agreements in the context of national regulations, ESCOs cannot easily develop an international activity, they rather have to be country-based even if, in some cases, they can be subsidiaries of multinational groups. The consequence is that a sector-limited focus at country level would lead to a small targeted market. Even in large countries, there are not so many cement plants or steel facilities. In addition, there is no evidence that, from a marketing perspective, it would be a good idea to have one ESCO trying to design and propose EE programs for all the companies of a given sector as potential clients might not always be happy to share the same service provider, which may retain confidential information. Finally, it should also be kept in mind that ESCOs do not often intervene in the production process per se. It may happen

naturally, but frequently both the clients and the ESCOs are reluctant to do so because of the much larger investments and risks involved. As a result, ESCOs generally concentrate on the utilities and commodities external to the production lines themselves (energy production and distribution, insulation, energy recovery, etc.). From this standpoint, a specialization in one particular sector may not bring well identified advantages as these technical subjects are transversal to industrial plants in general. It is however possible to imagine that in some industrial sectors such as agro-food, textile, mechanical manufacturing, characterized by a relatively large number of facilities (often SMEs at least in some countries), setting up a specialized ESCO could make sense, in spite of the likely small size of the transactions, which could be compensated by the gain made through the large duplication of similar projects. The conditions for such an initiative to materialize would be (i) first the availability within the ESCO of a team of energy auditors and engineer specialists from the targeted sector; and (ii) a reliable evaluation of the existence of a sufficient number of potential deals, equal to a reasonable business plan expectations, independent of the risk assessment issue previously mentioned.

1.9.2 Technology Analysis

Regarding the technology focus, the assessment might be somewhat different since various equipment manufacturers have been and are still today interested in developing an ESCO approach. This is particularly the case of large groups such as Honeywell, Siemens, Danfoss, Johnson Controls, Schlumberger or ABB, which have actually created ESCOs in various countries, sometimes with the support of International Financial Institutions (IFIs) (for instance Siemens with EBRD and Honeywell with EBRD and IFC). These initiatives make of course a lot of sense considering the technical expertise of these groups, which allows them to properly mitigate technical risks and design reliable EE programs. In this framework, two elements have to be considered regarding the support that could be potentially provided by IFC:

Usually, these large groups have strict internal rules and regulations that prevent them from directly financing projects (their core business is to manufacture and sell products, not to play the role of a bank). As a result, the ESCO model they want to privilege is the one where the financing is arranged through a third party financial institution while they provide a performance guarantee. Such a situation might lead to attractive direct lending opportunities for IFC, assuming that the projects to be financed meet IFC threshold constraints and that the credit risk of ESCO energy end-users is deemed acceptable. In this context, IFC could contemplate entering into a framework agreement with these groups, providing, under conditions to be agreed upon and subject to the ESCO technical guarantee, a standardized credit facility to be tapped each time the ESCO tries to arrange the financing of an EPC agreement. This is a strategy that was developed by EBRD at the end of the 1990s and it would be worth analyzing the results achieved.

More generally, it should be noted that a technology focus at the ESCO level is not necessarily in the best interest of energy end-users because it can introduce some opacity in the ESCO proposal, both from the perspective of designing the most efficient and cost-effective EE menu of investments and

from a pricing point of view. Energy end-users are often attracted by the ESCO model because of the transparency of the costs and the equipment selection procedures (especially in the public sector). Nevertheless, there are a few cases where such a focus makes sense. The best example is in the lighting area where relatively small ESCOs have developed adapted business models to help municipalities renovate their street lighting systems. In this field, the number of lamp manufacturers is relatively limited but, mostly, the ESCOs are not directly linked to lamp producers. They concentrate on street lighting but can transparently select the best appliances through a competitive tendering process. It should be noted however that, in that example, the performance guarantee does not play a great role as the savings can be pre-determined by the technical characteristics of the selected lamps. Therefore, the scheme is attractive for municipalities only if the ESCO bears the financial burden. By extension, public building (or even commercial building) lighting could also benefit from this specialized ESCO scheme in order to foster the use of new technologies (CFLs and LEDs).

1.10 PROPOSED TARGET MARKETS

1.10.1 General Market Evaluation

The following table presents a summary of the different potential existing ESCO markets in most of the IFC eligible countries where a minimum of ESCO activities or interest is present

Table 3: Evaluation of the ESCO Market in some IFC Eligible Countries - Africa

Elements of ESCO Opportunities	Tunisia
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	
Substantial Number of Active ESCOs	Today, the Tunisian market includes at least four ESCOs registered by the ESCO Association, ANME.
Sector/Technology Focus	The EE market in Tunisia is characterized by a large potential in the industrial and commercial sectors. Standard new efficient equipment (like variable speed drives, efficient lighting, controls, etc.) combined with thermal efficient measures constitute most of the technologies offered.
Government Support Exists (energy law, policies, programs, etc.)	Tunisia was the first country in Northern Africa to develop a policy mandating energy audits for large industries. It also created an energy conservation agency (the ANME) in 1985. A partial risk guarantee fund was also created that provides a guarantee of 50% of total bank exposure. In 2006, the energy efficiency law was developed for cogeneration. An EE fund has been created recently.
Potential ESCO Market	"The potential for energy efficiency measures in Northern African countries is estimated to be more than USD 1.5 billion annually over the next 10 years. The ESCO projects for SMEs have rather low investment sizes (less than USD 300,000). The size of the EE project for the commercial sector is also small and the investment is usually less than USD 250,000."
Public-Private Partnerships and EE Project Financing/Funding	"There is a lack of financing for EE investments. One of the main barriers to EE measures is the lack of project financing on reasonable terms resulting from commercial financial institutions' unfamiliarity with assessing EE investments. More than 23% of the investments are provided as a grant on ESCO projects."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	"There is a lack of expertise and intermediaries who could develop projects. The existing ESCOs are derived from consulting firms and have limited knowledge of the measurement and verification protocols. Insufficient technical and financial tools and high administrative barriers have hindered the start-up of an energy efficiency market. The quality of the energy audits was limited and until 2004 only 4% of the audits could be converted into real projects."
Other Barriers to Consider	Industrial energy end-users are more concerned with enhancing operations through improved production and productivity rather than with reducing operational costs, including through EE measures. Inadequate information is available in the industrial sector.

Table 4: Evaluation of the ESCO Market in some IFC Eligible Countries - Asia

Elements of ESCO Opportunities	Thailand
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	The support for the ESCO pilot project went beyond the grants for preliminary audit and the IGA to the very intensive training programs covering EPC, M&V, ECMs and energy audit procedures. A true ESCO project resulted from the Thailand ESCO pilot project. When it came to EPC, energy end-users still highly preferred 'loose' contracts. EPC was very new and innovative to Thailand. By 2001, the market had reached the stage where an EPC agreement was accepted by stakeholders (energy end-users, ESCOs, banks) and loans were approved by banks for the ESCO project. The first ESCO Fair was held in early 2005.
Substantial Number of Active ESCOs	"The ESCO Pilot campaign began with more than 10 companies but later became four companies trying to work their way into becoming ESCOs. There was a back and forth of trying to trim down the interested pairs of customers and ESCOs from more than 10, down to the final 4. The highly experienced international ESCOs and energy industry firms had to sustain some cultural differences."
Sector/Technology Focus	The ESCO Fund is open for use on designated buildings but mostly, it is utilized by appointed fund managers and ESCOs in the industry sector.
Government Support Exists (energy law, policies, programs, etc.)	In 1992, the Thai government announced the Energy Conservation Promotion (ENCON) Act to be used as a regulatory framework for energy conservation action, requiring designated factories or buildings to regularly measure their energy use, perform a detailed audit and set their targets to decrease energy usage. The "Low Interest Rate Loan for Energy Conservation" programs proved to be very successful pulling LFIs into loving EE/ESCO projects.
Potential ESCO Market	
Public-Private Partnerships and EE Project Financing/Funding	"The ENCON Fund was used to set up many financing mechanisms among which the Revolving Fund and the ESCO Fund. The Revolving Fund is allocated to 11 LFIs to lend money to the commercial and industrial markets. Commercial lenders (i.e., banks) did not easily understand that the cash flow from energy savings, under the ESCO risk management, could be trusted enough to repay the loan."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	Many companies rely on their in-house engineering departments. However, in-house engineers are not equipped with the needed M&V skills to document the savings, losing the targeted savings.
Other Barriers to Consider	"Companies are reluctant to invest in EE projects when the first project did not prove itself to be a good investment. In some projects, the actual savings advantage was lost in the lackluster performance of O&M personnel. Business firms are not familiar with non-conventional outsourcing, especially for intangibles such as knowledge, know-how, consultancy and risk. However, they would not want to pay the added expense for the energy efficiency expertise, which they believed unnecessary. Many clients seemed to believe that they could comfortably handle the EE technical risk by themselves and major customers were not willing to pay guaranteed/shared-savings fees to ESCOs."

Elements of ESCO Opportunities	Malaysia	Vietnam
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"The rapid growth of the industrial sector has strained the capacity of the sector having to focus on multiple objectives. There is an opportunity for ESCOs to assist the industrial sector in achieving energy efficiency objectives without compromising industrial productivity and growth. Several workshops, trainings and seminars related to ESCOs and the EPC concept have been organized. The transfer of knowledge and experience, facilitated by both local and foreign experts, has assisted the ESCOs in preparing bankable proposals and market their services to a wider clientele."	All current efforts from the Government of Vietnam and international organizations to create and maintain an open and electricity market based on competitiveness lead to expectations that the first ESCOs will be established in Vietnam within three years.
Substantial Number of Active ESCOs		
Sector/Technology Focus	The Malaysian Industrial Energy Efficiency Improvement Project was developed with energy audits, benchmarking, ratings and standards to remove barriers to the efficient use of energy by the industrial sector, specifically, cement, ceramic, food, glass, iron & steel, pulp & paper, rubber and wood. PTM and ESCO companies jointly carried out audits in the textile and oleo-chemical industries in 2005.	"A number of projects were implemented to study the use of energy in coal-fired thermal power generation, cement, ceramics, coal exploitation, metallurgy and other major industries, and to propose energy conservation measures applying to each sector."
Government Support Exists (energy law, policies, programs, etc.)	"Under the Eighth Malaysian Plan and the Ten Year Outline Perspective Plan, EE has been recognized as an important measure to increase the competitiveness of the country's goods and services. While the national energy policy provides a clear direction for energy-related activities in Malaysia, the absence of a comprehensive legal and regulatory framework is delaying the effective and sustainable implementation of EE projects."	
Potential ESCO Market		
Public-Private Partnerships and EE Project Financing/Funding	"The lack of participation from local financial institutions in EE projects stems from their lack of awareness about the potential benefits of such ventures. Those who have been approached in the past by potential borrowers (ESCOs and industrial firms) were not convinced that the proposed projects were bankable or feasible. They view EE projects as high risk and low-return ventures. An EE project loan-financing scheme of MYR 16 million has been set up at the Malaysian Industrial Development Finance."	Until 2004, most financing sources for such EE projects came from international funding facilities. Many EE-related investments were financed partially by loans from commercial (private) banks to SMEs.
Technical Framework Preparedness (IGA, M&V, tools, etc.)	Energy auditing is a proven effective energy management tool and has been practiced by energy professionals in Malaysia since the 1980s. Most ESCOs began by providing engineering services or consulting to clients, but later, they moved into providing financial solutions as well as risk mitigation services for EE activities. The ESCOs then began backing their services with performance guarantees, securing the financing for projects and introducing a method of loan repayment from the savings enjoyed.	The M&V methods are not well defined and agreed upon among stakeholders.
Other Barriers to Consider	"EE technologies usually come with a high price tag and industries are often reluctant to invest in activities that do not have visible benefits to productivity or profit levels. Besides, factories tend not to prioritize energy efficiency because of the relatively low price of energy. Also, the conventional financial loans are not viable for EE projects because of the government subsidy of energy prices. Overall, the current status of the ESCO industry in Malaysia remains not encouraging despite efforts by the government. Electricity tariffs are low. There are no tax incentives nor EE regulations. There are no certification of ESCOs nor energy professionals. The government needs to do more on top of recognizing the importance of EE and taking some initiatives."	In terms of EPC, most projects are contracted outright so that the energy end-user pays a certain amount of money for the consultancy services provided or equipment acquired. Payment based on the results of savings is perceived as high risk. There are insufficient legal guidelines/directives to support EE activities. The National Accounting System has not been adjusted to deal with the off-balance sheet nature of the EPC concept. Unavailability of financing sources remains a barrier.

Elements of ESCO Opportunities	India
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	In a study conducted in 2007 by Econoler International, 38 projects in the public sector developed by ESCOs were identified. In India, only the shared-savings model is strongly discussed. Currently, it is challenging for ESCOs to obtain bank credit and they usually utilize their own equity to finance an ESCO project in the public sector.
Substantial Number of Active ESCOs	Several EE projects were being implemented by 16 ESCOs. An active ESCO in the private sector has been taking three to five projects each year and completing one or two using the guaranteed-savings model (supported by technical guarantees only).
Sector/Technology Focus	"Conservative overviews indicate that the ESCO market in the Indian public sector is huge and most of it is still untapped. The development of the private sector market has been aided by the WB's Three Country Energy Efficiency Project. In particular, the project has focused on three clusters: paper, steel and glass."
Government Support Exists (energy law, policies, programs, etc.)	In 2001, the government passed the Energy Conservation Act and established a statutory body, the Bureau of Energy Efficiency, for regulation and promotion. In 2002, the prime minister called on the government to reduce energy consumption by 30% in the next five years. While the 30% goal was not achieved, the ESCO model became recognized as an effective mechanism for delivering EE.
Potential ESCO Market	"The ESCO concept was piloted in nine states, averaging five to six projects per year from 2004 to 2007. EE projects in 2007 were typically small projects with 43% costing less that USD 300,000 and 57% requiring investment costs under USD 500,000. The ADB estimated that India had an immediate energy savings potential of 5,300 million kWh and peak savings of 2,188 MW, which corresponded to an investment of INR 17.2 billion. The investment size was estimated between USD 323 and USD 374 million."
Public-Private Partnerships and EE Project Financing/Funding	"In 2005, several ESCOs joined together to form an association, the Indian Council for Promotion of Energy Efficiency Business (ICPEEB). The ICPEEB has aided in increasing the awareness of ESCOs and has worked to maintain dialogue with authorities for ESCO market development. To date, none of the WB funds on getting EE financing from LFIs have gone to an ESCO. Banks treat ESCO projects as normal commercial projects focusing on the borrower's assets. ESCOs are requested to provide bank guarantees by public sector clients and banks ask them to provide collateral."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	The design and implementation of a fair and easy to understand M&V protocol is required. The ESCOs are unable to develop such adequate protocols and the energy end-users do not see this as crucial at the time of the contract signature, until the time comes for determining the energy savings. Sometimes, ESCOs agree to adopt simpler methods that may be approximate, rather than a theoretically accurate one which is perceived as a considerable investment in measurement. There appears to be little recognition and acceptance of the IPMVP by the Indian ESCOs.
Other Barriers to Consider	"Despite a decade of efforts to promote an EE market, the ESCO concept is still relatively unknown and unexplored in India. The absence of big players, the limited financial ability and inadequate past experience cause ESCOs to seem untrustworthy to energy end-users as well as banks. A broad barrier in the private sector to the realization of an ESCO industry is the absence of information regarding the development of projects and management's lack of attention to identifying or conceptualizing energy service projects. The actual public procurement system has drawbacks and several ESCOs consider it as being so complicated and costly that they usually decide not to bid, thus the tendering process is often declared unfruitful. Inadequate M&V can create potential conflicts between the parties and thus increase doubts about the ability of ESCOs to deliver the guaranteed results."

Elements of ESCO Opportunities	China
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"In 1998, the WB/GEF started the China Energy Conservation Project to introduce, demonstrate, promote and enhance the EPC mechanism and increase EE through energy conservation projects. The success of the three pilot ESCOs in 1998 proved that EPC has great development potential in China and it is feasible and profitable to have more ESCOs. By the end of June 2006, the three pilot EMCs had implemented 475 EPC projects for 405 energy end-users. The accumulated investment had reached USD 181 million. A national industry association is available - the China Energy Management Company Association (EMCA)."
Substantial Number of Active ESCOs	"By the end of 2007, the EMCA registered membership reached 300 ESCOs from 59 in 2004. The investment of EPC projects reached about USD 1 billion. Of the 308 ESCOs across China, most are in the North (45%) and East (18%). There are fewer ESCOs in Northeast (5%) and Northwest (6%)."
Sector/Technology Focus	"Service fields of ESCOs in China are three dominant market sectors: industry, building and traffic. Most of the EPC investment goes into the industry field with most projects implemented in the retrofit of the buildings. ESCOs started their business in the heavy industry field, where the energy consumption is great. In recent years, the building field has become quite popular due to the large number of buildings, including universities, hospitals, commercial buildings, hotels and government buildings."
Government Support Exists (energy law, policies, programs, etc.)	Numbers of relevant laws, regulations and national policies on energy conservation have been promulgated and published. It is evident that the government is quite firm on pushing forward with energy conservation work.
Potential ESCO Market	Estimates show that there is great potential for energy conservation. The projects that are technically feasible and economically reasonable represent a market size in excess of USD 100 billion.
Public-Private Partnerships and EE Project Financing/Funding	"The EMC (ESCO) Loan Guarantee Program, which provides financial support for ESCOs, was officially launched in 2003. Through this program, the Investment Guarantee Company has supported 36 ESCOs to get commercial loans for 113 EPC projects, with a total investment of USD 83.85 million, and a total guarantee of about USD 49.43 million. The industry is developing, the capacity of the ESCOs is improving and the financing channel is widening,"
Technical Framework Preparedness (IGA, M&V, tools, etc.)	"For ESCOs that provide EPC services, the capacity to implement a simple project is needed but more importantly, the capability to do an energy audit, design the project and manage EE projects. The “technical” ESCOs lack the capability of technology innovation which prevents them from becoming broad-scale service providers."
Other Barriers to Consider	The overall scale of the ESCO industry is relatively small compared to the great demand for the energy service and market requirements. There are about 20 very large ESCOs among EMCA’s 600 members, most are SMEs. Most of the ESCOs lack financing methods, technical capacity and provision of solutions for customers. Since the ESCO industry is quite new, there are not enough professionals and talented people to meet the demand of this fast developing industry.

Table 5: Evaluation of the ESCO Market in some IFC Eligible Countries - Eastern Europe

Elements of ESCO Opportunities	Czech Republic	Poland	Romania
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	The Czech Republic is the ESCO frontrunner among Eastern European countries, even though the market is still considered to be in its initial period. The EPC concept has been known since 1992. EPC is recognized as one of the support mechanisms for energy saving. The most common contracting form is guaranteed savings. The first EPC project was the renovation of the thermal energy handling system at Balovca Hospital. About 70 projects have been completed through EPC but over 30% of these have been performed by one ESCO.	"It was at the beginning of the 1990s that the first company, ECOGY, conducted the modernization of a coal boiler house which was designed to be re-paid by the savings achieved by the client. In the late 1990s, the ESCO model became a rather commonly used method for the modernization of heating systems at military units. Presently, not many ESCOs conduct EPC-based projects. The number of companies that have active EPC agreements is estimated to be between 8 and 13 only, primarily led by Siemens."	Training in EPC was funded by USAID as early as 1992. Energy Efficiency Fund 63 was established by the World Bank and financed by GEF and the Romanian government to increase energy conservation activities and implement measures.
Substantial Number of Active ESCOs	"There are currently about 17 ESCOs in operation: five companies focus on providing services according to the EPC concept, two companies work as energy service providers and approximately a dozen companies provide long-term energy delivery contracts."	Large global and European companies (Dalkia, MVV, Landys & Gyr or Siemens, Ineoineo, and Auxima Services) began to open their branches in Poland in the late 1990s. Three other companies were founded by the Polish Electro Energy Network.	"Currently there are two companies—one specializing in electricity and the other in thermal services which qualify as private ESCOs and offer pure EPC solutions. In addition, there is one ESCO-type company chiefly working with CHP projects. There are a few regional ESCOs active in Romania offering energy supply contracting."
Sector/Technology Focus	"The public healthcare sector is the primary focus for ESCOs, while educational buildings, military and other state-owned sectors are appealing projects, too. Apart from the public sector, the private sector (typically industry) is also on track regarding energy efficiency investments."	ESCO projects actually include all of the market sectors. French Dalkia and German MVV are active in municipal projects. The most often implemented EPC undertakings in the ESCO model are the thermal modernization of buildings, replacement of heating sources and the modernization of street lightning.	There are not any technical barriers to carrying out EPC projects in Romania as all the new technologies are available.
Government Support Exists (energy law, policies, programs, etc.)	A new law was passed in 2001 that made energy audits obligatory for large consumers.		"The Romanian Energy Efficiency Law was passed in 2000, which puts forward a number of measures to support energy efficiency. Audits are obligatory above a certain size. However, penalties are so small that plants prefer to pay them than comply with this regulation."
Potential ESCO Market	EE savings are estimated at about EUR 100 million or EUR 10-20 million/year.		
Public-Private Partnerships and EE Project Financing/Funding	"Financial institutions, including mostly local banks, are available and are ready to participate in TPF. The IFC is running its "Commercialization Energy Efficiency Facility," providing loan guarantees for ESCOs and end-users."	The main financing sources have been commercial banks, private sources, LFIs and, until the end of 2008, the World Bank.	
Technical Framework Preparedness (IGA, M&V, tools, etc.)	It would appear that more attention needs to be given to appropriate project implementation and especially M&V.		
Other Barriers to Consider	Skepticism by management towards EE investments and EPC still lingers. Prejudices against complex solutions remain strong. ESCOs are not yet ready to take projects with a long payback period (more than 6 years). There is still room to develop and some sectors with a high savings potential have hardly been tapped (such as the military).	"The Industry sector has had real difficulty accepting the ESCO model due to negligible amounts of savings compared to total operating costs. EPC models lack references concerning the financial settlement for this kind of business activity leading to apprehension among the potential customers to adopt TPF. An important area that restricts the efficient market has been the lack of functional financial instruments that are specialized in ESCO companies. Even those easiest and most popular; i.e., guarantees, were practically out of reach."	Financial barriers remain. Banks still lack the internal expertise to evaluate energy efficiency projects. They are not yet ready to finance projects based on the credibility of the investment and the prospects of savings, but still use the traditional asset-based financing and evaluate client creditworthiness.

Elements of ESCO Opportunities	Hungary	Slovakia	Croatia
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	The ESCO industry in Hungary dates back to the early 1990s with EPC training funded by USAID. After 15 years, the market is experiencing stagnation.	"2003 could be considered as the real starting point for ESCOs. The Energy Center in Bratislava has divided companies providing EPC to their orientation and potential to offer ESCO services."	So far three projects have been completed in the country with above 40 projects more in the preparation or implementation phase. The "first out" contract model has been used in past projects.
Substantial Number of Active ESCOs	"Based on a registry of the Energy Center, there are about 30 ESCOs or ESCO-type companies but five or six companies cover 80% of the market."	By 2006, there were about 30 ESCOs and ESCO-type companies.	There is currently only one established ESCO (state-owned) offering EPC, which was established in 2003. There are new companies that are attempting to enter the market and there are many EE provider companies that do not offer guarantees.
Sector/Technology Focus	Projects were primarily focused on public lighting, cogeneration, district heating system improvements, heating and hot water system interventions, industrial water and steam supply, air conditioning, automation and biomass. Recent figures suggest the distribution of ESCO projects is 30% in industry, 30% in district heating retrofits and development, and 30% in the municipal sector.	ESCO clientele includes municipal buildings, schools, banks and hospitals. Outsourcing in the industry and private facilities is becoming more and more popular. ESCOs normally participate in building renovation and public lighting projects.	EE projects have been focused on public lighting, system improvements in educational buildings, cogeneration, HVAC, steam system recovery and insulation.
Government Support Exists (energy law, policies, programs, etc.)		Government commitments have been emphasized in the 2005 National Energy Policy. This policy identified many tools promoting energy efficiency, such as minimum requirements for the energy efficiency of new and large existing buildings.	The legislative framework is not particularly supportive of the ESCO concept. Secondary legislation on EE has not been developed and the ESCO model is not recognized by the authorities as an individual business model.
Potential ESCO Market	The ESCO market size is approximately EUR 150-200 million worth of investments.		The estimated potential for energy savings in Croatia exceeds EUR 400 million.
Public-Private Partnerships and EE Project Financing/Funding	Municipal authorities often feel uncomfortable about sharing the financial benefit of their project with a private company. Financing of ESCO projects by banks is not a problem. TPF is a well-accepted and widespread scheme. Banks are particularly open to participation in EPC.	"Foreign-based companies whose main profile is energy systems operation, such as district heating operators, are public-private partnerships in the form of joint ventures of private companies with municipalities."	"Besides international aid and loans, local financial institutions have proved to be interested and the ESCO's own equity is being used for project implementation. There is the Fund for Environmental Protection and Energy Efficiency (in the form of subsidies)."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	Industrial/commercial sites and buildings sometimes lack baseline data as they do not have detailed billing systems and pay average fees per month, not according to the real consumption. ESCOs cannot prove the savings achieved using such information or they have to spend one to two years before an EE project begins. Accepted M&V practices have not been widely introduced.	There is lack of data to construct baselines. Energy prices are subsidized.	
Other Barriers to Consider	Presently, EE project payback periods are longer (5 to 7 years), which is actually one of the major challenges ESCOs are facing. International aid, which was previously very substantial, is decreasing or coming to an end. Most local authorities are still not informed about the opportunities ESCOs offer and are often suspicious of the financial schemes.	"The banking sector still has limited understanding of, and experience with, EE project financing. Banks therefore perceive such projects as risky, resulting in lending terms that may not be acceptable for ESCO project developers. This limits ESCO activity to the large ESCOs that can financially support their own activity and could limit the growth of the sector in the medium term."	"Consumers show a lack of interest in EE due to little knowledge about ESCO benefits and lack of understanding of the concepts. Public procurement is complicated."

Elements of ESCO Opportunities	Russia	Bulgaria	Ukraine
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"There is absence of established ESCOs, capable of ensuring reliable and effective design management, ready to guarantee energy savings to investors and users in the periods of investment recovery. The ESCO market in Russia is just forming. The ESCO concept, however, is new and not widely recognized. ESCOs often provide only consulting services and they are not ready to take investment risks. There is no ESCO cooperation, alliances."	The first ESCO project was implemented in 1998. Two projects addressing the ESCO methodology were implemented in 2003 and 2005 with 350 municipal buildings included in a project financed by a first big ESCO. Since 2006, the Energetics and Energy Savings Fund SPV (EESF), a special purpose company, purchased receivables under more than 20 EPC agreements with a total nominal value exceeding BGN 8 million.	Ukraine is a country of transition economy where the ESCO industry has progressed sluggishly with relatively few EPC initiatives. One of the most crucial obstacles in Ukraine is scarce information and awareness about ESCOs, the EPC concepts and the opportunities underlying in EE investments. ESCOs and EPC models remain relatively new in Ukraine. The ESCO industry in Ukraine remains quite unaccustomed to international ESCO best practices.
Substantial Number of Active ESCOs	There are not many ESCOs and they are not yet ready to provide comprehensive EPC solutions.	There are about five relatively large and actively working ESCOs. There is another 10 companies in the market, practicing forms between EPC and leasing.	There are currently about three active ESCOs in Ukraine with a few dozen local ESCO-like engineering consulting firms. Some foreign ESCOs also attempted to enter the country's ESCO industry. Nonetheless, none of these ESCOs were able to provide the full range of EE services of a typically defined ESCO.
Sector/Technology Focus	"The majority of projects are in the public utilities sphere. Their aim is to modernize heating systems and to raise the efficiency of energy consuming equipment. Heating projects are key because Russia annually spends about 30% of total energy consumption on heating."	Several municipal projects were implemented fully credit financed (no grants) under relatively tough conditions (18% interest rate and 200% collateral). Most projects address buildings and street lighting. Only one project is implemented in district heating. In most cases, recipients are municipalities. EE projects in kindergartens, schools, hospitals and other public buildings are also supported.	The industrial sector is the major source (70%) of ESCO projects primarily because industrial plants can provide collateral and guarantees.
Government Support Exists (energy law, policies, programs, etc.)	Elaboration of the principles and mechanisms of government policy in energy savings in Russia began in 1992. The federal law on energy savings was issued in 1996. At the end of the 1990s, the first five national standards on energy savings were issued. Complex government policy in energy savings is beginning to be formed in Russia and some of its elements are developing quite successfully. There is no legislation pertaining to ESCOs.	"There has not been specialized legislation addressing ESCOs. In the current EE act, there is language dedicated to EPC, which offers the main rules of the process and the relationships between ESCOs and their partners. The uncertainty of ESCO regulation/legislation presents an additional risk to investors. Some laws related to ESCOs were first adopted in 1999, abolished in 2001 and reinstated in 2003. A positive action related to EPC section has been introduced in the Energy Efficiency Act of 2009. This article envisages state or municipal property as potential recipient of EPC projects in the budgets of respective ministries or municipalities and allows planned and ensured financial means for the execution of the contract to correspond to the normalized expenses for energy of these buildings."	The Ukrainian government has played a major role in developing UkrESCO, a state-owned joint stock ESCO. The government has expressed interest in promoting private EPC as a means of raising EE awareness in state-owned facilities, theoretically providing a legal basis for using EPC in the state sector.
Potential ESCO Market	There are no statistics or sufficient information on the ESCO business to provide an accurate estimation of the market. EE projects have a potential of 40-45% energy savings.	"The economic potential for energy savings is believed to be especially high in Bulgaria. Energy intensity is twice that of the EU average, while electricity intensity is outstanding even in the region, four times higher than in Hungary or Turkey. The savings potential is estimated to be up to 50% of the energy demand of the building stock and 30% in industry. The market of ESCO services includes more than one million homes, thousands of public buildings and more than 1,000 enterprises. The investment needs of this market are over EUR 6 billion."	Ukraine is one of the most energy-intensive and inefficient economies in its region. Electricity end-users (especially in the residential sector) have an energy-intensive lifestyle. According to stakeholders in the Ukrainian ESCO market, low energy prices have hindered the development of ESCOs in the country.
Public-Private Partnerships and EE Project Financing/Funding	"A federal purpose-oriented program has accomplished less than 50% of its intended results in 1998 due to the failure to establish financial mechanisms for implementation of energy saving projects. The financing of another federal program for the 2002-2005 period was only about 1/5 of the planned amounts, meaningful results not being achieved. There is a lack of private investments that would be the main force in improving EE."	"ESCOs have used their own financial means or credits. There are a lot of financial institutions ready to finance ESCO projects. The Bulgarian Energy Efficiency Fund (BEEF) is operational, providing financing for three types of ESCOs: partial credit guarantee, joint crediting with commercial banks and TA for project development. The Bulgarian ESCO Fund - Energetics and Energy Savings Fund SPV (EESF) is set up to finance the energy services business. There is lack of trust between partners. Municipalities have suspicions regarding the negotiated results and ESCOs are afraid of regularity of payments."	Most EE companies do not necessarily adopt EPC nor do they provide financing for EE projects. Numerous ESCOs would like to do EPC but they can hardly find financing sources. ESCOs have very limited access to capital, both internally and externally. LFIs impose very high interest rates and are not readily involved in EE projects.
Technical Framework Preparedness (IGA, M&V, tools, etc.)	There is an absence of rules for the calculation of obtained savings on a systematic basis, and for the accumulation and distribution of data among participants.	There are difficulties establishing baselines and energy savings, no recognized M&V approach exists).	
Other Barriers to Consider	"There is no state organization in charge of developing the ideas and methodology of energy saving. Currently state supervision organizations have no right to control and supervise EE. Majority of Russian enterprises were not paying their utility bills."	Given the thin financing capacity of ESCOs, TPF is often necessary. However, the concept of TPF is misunderstood and not trusted enough by potential ESCO clients.	Energy prices are often subsidized to varying extents making EE projects often very difficult to develop, implement and finance. Many ESCOs in the country realized that customer training is also a critical success factor to helping clients understand the benefits of EPC mechanisms. The lack of legal basis for EPC is another impediment that impacts the perceived risks involved and ultimately affects the number and cost of signed EPC agreements.

Table 6: Evaluation of the ESCO Market in some IFC Eligible Countries - Latin America

Elements of ESCO Opportunities	Mexico
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"Mexican ESCOs offer identification, development, financing, installation and operation and maintenance services at energy end-user facilities on a performance basis. The energy end-user is offered no-cost financing through EPC. Most Mexican ESCOs offer a shared-savings structure; however, a couple of well-established ESCOs with good track records are able to get energy end-users' commitments to pursue the guaranteed savings structure."
Substantial Number of Active ESCOs	"Until 2005, some 10 ESCOs were actively being supported by the government. Several consulting and engineering firms showed strong interest in becoming ESCOs, but the transaction costs of acquiring the technical and financial know-how, along with accessing financing resources, made it very difficult for them to turn into ESCOs."
Sector/Technology Focus	Most of the Mexican ESCOs have focused on specific sectors, wherein their expertise has a significant effect on energy consumption and/or water consumption reduction. For example, Optima Energia has successfully developed projects for the commercial sector, especially hotels and hospitals. In these cases, technologies focused on heat recovery systems, sea water for cooling systems, lighting, peak generation, etc.
Government Support Exists (energy law, policies, programs, etc.)	"There is current government support to develop tools to facilitate ESCO market deployment."
Potential ESCO Market	The size of projects in Mexico range from USD 100,000 to USD 5 million, which presents a problem since these projects are too big for micro finance programs and too small for typical transaction costs.
Public-Private Partnerships and EE Project Financing/Funding	The most typical financing sources for performance-based projects in Mexico are ESCOs, the energy end-user's own money, participation of private trust funds, development banks and commercial banks. ESCOs participate in EE projects either with their own money, private equity funds, and/or leasing structures. The participation of LFI's in EE financing has been very marginal. Accessing project financing by project developers and ESCOs has been particularly difficult.
Technical Framework Preparedness (IGA, M&V, tools, etc.)	"Not too many ESCOs have enough technical capacity and technology partners to include comprehensive measures with a positive interaction. Most of the ESCOs focus on a specific technology where they have either mastered their skills, have a joint venture with the equipment manufacturer, or are themselves the manufacturers. Since the market is still very new, there are no standardized documents, such as EPC agreements or traditional audit reports, IGA reports, or even a series of elements that these documents might integrate in order to have a successful project. M&V of savings, which is critical for EE project implementation, is not a standardized practice."
Other Barriers to Consider	"Several market barriers include the lack of awareness, high transaction costs, lack of tax incentives, current procurement rules that are disincentives to ESP development, unknown size of the market, and problems accessing financing. Accessing financing has proven to be difficult enough to have an effect on the growth rate of the industry. Because ESCOs are often unable to demonstrate positive profitability of their company in earnings reports in the first period of the contract, banks consider these operations risky and request collateral."

Elements of ESCO Opportunities	Chile
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	EE investments, financed with ESCOs' own capital, are limited to a maximum of USD 50,000/contract. Contract duration ranges from two to five years. ESCOs receive part of the savings but offer no guarantee as to achieving the predicted savings. To date, TBE Chile has entered into 65 EE contracts, most of them in commercial buildings. The other type of contract offers an estimate of potential savings based on preliminary audits. Dalkia offers "chauffage" type contracts in which it establishes the "utility" price, calculates performance and commits to a savings value, which only varies depending on fuel prices.
Substantial Number of Active ESCOs	Two major ESCOs exist, Dalkia and TBE. Surveys of companies and consultants have led to training activities for future ESCOs within the framework of a technical assistance project of the Inter-American Development Bank.
Sector/Technology Focus	ESCO activities focus on the commercial sector, buildings and large shopping malls, and on the industrial sector, primarily agricultural and food industries. No energy contracts have been signed with the public sector. Some energy audits have been conducted but they have not resulted in tenders for contracts.
Government Support Exists (energy law, policies, programs, etc.)	Increasing EE in all sectors is expressed in Programa País de Eficiencia Energética (PPEE), created in 2005, as well as in the Policy of Energy Security "Política de Seguridad Energética (PSE)" established in 2006. The strategic plan 2007-2015 outlines specific objectives, including "the development of product and service markets associated with EE" and "to have ESCOs in the energy services market." The "green procurement policy" is envisaged in the PPEE strategic plan for the public sector.
Potential ESCO Market	On average, TBE clients have obtained 26% savings in their electricity bills. Annual sales by TBE total USD 750,000. One of the fundamental factors influencing recent market growth is the increase in energy prices. Chile today has the highest electricity prices in Latin America. About 30% of companies had undertaken no energy improvement activity despite results of energy audits conducted over the past few years.
Public-Private Partnerships and EE Project Financing/Funding	"Dalkia is the only ESCO with experience in the private hospital sector and it participates in public-private partnership projects in the public hospital sector. The creation of the PPEE has been based on the principle of public-private partnerships. This initiative is one of the most explicit governmental decisions to face the problem of energy supply and is an integral part of its energy and environmental policy. In addition to the Ministry of Economy's subsidizing pre-investment studies, a credit line is in place for long-term investments in environmental protection which includes EE issues. The financing scheme follows the shape of a private bank credit or leasing operation for a maximum amount of USD 1 million with a fixed interest rate slightly below normal credit rates, payback periods between 3 and 12 years and grace periods up to 30 months."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	"Dalkia offers different types of EE service contracts for industry and commerce while TBE Chile's main focus is on commercial buildings and industry, offering two approaches: (1) EPC and (2) procedures for optimizing energy costs (energy audits, etc.). TBE has specialized in contracts to optimize EE in commercial buildings with central AC. Dalkia offers its services to all segments in the market (except public lighting), but concentrates primarily on the industrial area with approximately 120 thermal power plant energy management contracts, catering to international and domestic clients of the agro-industrial and food industries. The lack of knowledge and accreditation of M&V instruments and procedures favor the doubtful attitude of potential energy end-users about the novel offer of this type of services."
Other Barriers to Consider	There is still a deficit of information on the issue of EE and on the management instruments that exist in the international market. In 2007, around 85% of companies across the nation had conducted neither energy audits nor diagnoses, and had no information about their own energy performance in comparison with their competitors. Until recently, high availability of hydro power and the supply of cheap natural gas from Argentina kept electricity and gas prices low. There is no registry of energy consumption in public buildings or relevant information to make comparisons. Lack of financial mechanisms for energy efficiency projects has made ESCO start-up more difficult. The problem is primarily credit conditions that can't be accommodated in the financial arrangements of EE projects.

Elements of ESCO Opportunities	Brazil
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"The ESCO business in Brazil dates from the mid-1990s with the first seminar on the EPC concept held in 1995 and in 1997 the Brazilian ESCO Association (ABESCO) was founded. This period saw the beginning of the definition of the ESCO business and the public discussion of EPC agreements. Projects under utility DSM were structured as performance contracts between the utility and the energy end-user, where payments were included in the utility bill (and could not exceed the monthly savings). Many utilities opted to contract ESCOs to execute DSM projects. It is estimated that in 2002 about 117 projects worth BRL 23.5 million (USD 8.7 million at the time) had been contracted to ESCOs by utilities. However, ESCO contracts with the utilities used standard cost-plus engineering services, not performance contracts, for this work."
Substantial Number of Active ESCOs	"The growth of the ESCO sector has been substantial. The ESCO sector has matured more than the increase in volume of business alone would suggest. However, there has been no attempt to systematically survey the ESCO sector. ABESCO was founded with 15 members. Today, ABESCO has more than 50 members, most being firms providing specialized EE services."
Sector/Technology Focus	Commercial buildings are the largest market segment for ESCOs, followed fairly closely by projects in industry. A large program (RELUZ) was launched in 2000 specifically to finance energy efficiency in public lighting. By the end of 2004, contracts had been signed with more than 1,400 municipalities.
Government Support Exists (energy law, policies, programs, etc.)	"There have been some recent initiatives from the government to explicitly promote the ESCO sector. Previously, there had been almost no official encouragement. The one partial exception involves utility DSM programs. A law allowed utilities to invest up to half their EE resources in projects in which they could recover the cost of the investment. The ESCO business in Brazil had its beginnings in the performance of energy audits for government programs that sponsored nearly 600 audits. The national program to promote the efficiency of electricity use was created in 1985. Few investments in actual retrofits occurred. A presidential decree in 2000 required all federal buildings to reduce their electricity consumption by 20% within two years."
Potential ESCO Market	A survey of the ESCO sector in 1996 estimated that BRL 16-17 million (USD 16-17 million) of projects had been implemented. An important new ESCO market was opened by legislation in 2000 regulating utilities' DSM programs where utilities had to spend a percentage of their revenue on EE projects. Most ESCOs are independent engineering consultant firms. However, there are a few which are subsidiaries of larger companies which manufacture equipment, such as Johnson Controls, or are energy utilities. About 40% to 55% of ESCOs had income from EE below BRL 1 million (worth about USD 325,000 in 2003 and USD 410,000 in 2005, respectively).
Public-Private Partnerships and EE Project Financing/Funding	"The legal issues about tendering EPC agreements for government buildings were not resolved, so little happened and the public building market has remained largely closed for ESCOs. In May 2006, the National Bank for Economic and Social Development (BNDES) approved an innovative new credit line, called PROESCO, designed to address the problem of guarantees for loans to EE projects."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	ESCOs offer specialized EE services and they are prepared to guarantee a level of savings and to verify their performance using M&V procedures.
Other Barriers to Consider	When ESCOs provide the financing for a project it is almost always with their own capital. Loans to ESCOs to finance EE projects have been very rare. The lack of access to TPF has historically been a key barrier to the expansion of EE services. There is lack of awareness and right ESCO perceptions from the market. Often, there are difficulties in the decision-making and/or procurement process of potential energy end-users. Distortions in energy (or other) pricing affects the economic viability of EE projects. The credibility of ESCOs and of the EPC mechanism is not yet stable. There is a lack of financing sources for EE projects, especially access to TPF.

Elements of ESCO Opportunities	Uruguay
ESCO Market Preparedness: Awareness and Application of EPC, ESCO/EPC Demonstration Project Availability, and Other Implemented ESCO Projects	"A number of small and medium-sized engineering firms participating in the energy market in 2000 began covering many of the tasks a “real” ESCO would perform but did not guarantee the results. A couple of engineering firms, categorized as quasi-ESCOs, are almost working as ESCOs. They have limited capitalization for financing projects and for arranging TPF schemes. It will still take a couple of years for UTE-USCO to have sufficient project experience to operate as a true ESCO."
Substantial Number of Active ESCOs	
Sector/Technology Focus	Typical ESCO projects covered municipality, wool, leather, plastics, paper, metallurgic and food industries, agriculture, laboratories, shopping centers, public and private hospitals and even cinemas.
Government Support Exists (energy law, policies, programs, etc.)	"Uruguay state-owned utility introduced time-of-use tariffs to alter the load curve and reduce peak demand, with the relationship between the peak and off-peak levels about 4:1. The utility also established a new minimum admissible power factor limit, with stronger economic penalties. Another program called “Superplan” allowed customers to acquire electricity-consuming household appliances at a relatively low interest rate financing."
Potential ESCO Market	Uruguay is 100% dependent upon imported oil.
Public-Private Partnerships and EE Project Financing/Funding	"Until recently there has been little financing of EE projects by the ESCO sector. Most EE projects have been financed by the energy end-user’s own money. In the few cases where the ESCO has financed the project directly, financing came from the energy firm’s capital. With the implementation of the Uruguay Energy Efficiency Project, two new financial sources are becoming available: GEF funds directly used by UTE-USCO through EPC with energy end-users and an EE fund established with part of the GEF grant. Basically, this new fund will operate as a guarantee fund."
Technical Framework Preparedness (IGA, M&V, tools, etc.)	There is a need for capacity building on IGAs, M&V and other tools for true ESCO operations.
Other Barriers to Consider	"Natural gas is far more expensive in Uruguay than the liquid fuels that it is supposed to replace, which reduces economic incentives for energy efficiency projects. Presently, there is a lack of demand for energy-efficient goods and services. Public knowledge about the financial and economic benefits of EE measures is limited. The market does not provide customers with information on potential cost savings, energy savings and emission reductions. Businesses in Uruguay, as elsewhere, tend to invest in capital equipment to increase output rather than reduce costs. Information on EE measures or the ways to structure, finance and operate ESCO-based savings initiatives is scarce. There is limited capacity and know-how among key stakeholders. There is a lack of EE project development and investment financing without availability of credit from the banking system."

1.10.2 Market Prioritization

It is very difficult to propose prioritization of countries for IFC as several potential opportunities may exist. The type of approaches (utility-based ESCOs, working with LFIs, financing directly ESCOs) may also present different opportunities in different countries.

In a first step, we would recommend that IFC focus on the three largest EE markets (i.e., China, India and Brazil). This recommendation is made based on the following rationale:

- The potential size of the market presents more potential opportunities for IFC;
- The number of existing ESCOs with relatively good technical knowledge and experience in the concept;
- The size of the potential deals to be targeted by such ESCOs, assuming that the right adapted financing mechanism is available.

It remains that each of these markets are deficient in some ways and may not offer easily and in sufficient numbers the type of deals that are looked for by IFC.

Other markets that could be of interest because of their size, the initial presence of some ESCO activities or just because of the huge potential for EE projects that could be targeted by ESCOs include:

- Mexico
- Ukraine
- Russia
- Thailand.

Assuming that IFC would be interested in a utility-based approach for such projects, we could potentially add to the list of previous countries the following:

- Indonesia
- The Philippines
- Romania.

These recommendations would have to be revised in light of the interest of IFC for such countries (or others) and considering many other elements that will have to be discussed with IFC.

2 RECOMMENDED ENERGY EFFICIENCY FINANCING MECHANISMS FOR IFC

In order to achieve any meaningful implementation of EE projects in IFC eligible countries, EE funding needs to be available on a local basis to ESCOs, vendors and other developers of EE projects, which is ***commercially attractive*** to them and to end-use facility owners where EE projects are installed. Furthermore, since in many IFC eligible countries most of the energy is consumed by industrial energy end-users, this under-served EE market sector needs to be addressed with structures different from the "guaranteed savings" model predominant in North America.

To be ***commercially attractive***, the EE funding should: i) not create a significant risk or negative impact on major commercial EE stakeholders beyond their core business and competencies; ii) be relatively simple to access on a local basis; and iii) be reasonably priced.

The EE project-related risks that each of the major EE stakeholders could reasonably be expected to assume based on their respective core business and competencies are as follows:

- **Energy end-users** – performance risk of EE projects related to operating conditions, use and level of facilities;
- **LFIs** – credit risk on repayment of EE loan;
- **ESCOs** – development, implementation and operating (performance) risk of EE projects;
- **Investors** – EE project risks related to achieving targeted IRR plus pro-rata share of energy end-user credit risk.

One of the major challenges to getting EE projects implemented by industrial energy end-users is that they generally are unwilling to use their capital or encumber credit capacity to fund EE projects versus their core business activities. This is due in large part to the relatively low returns of EE projects versus industrial energy end-users' core business investments, coupled with their perception that EE projects reflect energy and "utility" infrastructure assets that only need to be replaced when they break. Even EE projects with very high (25-50%) IRRs are often unable to compete with 100%+ IRRs on core business investments of many large industrial energy end-users.

To summarize, industrial energy end-users rarely implement EE projects on a stand-alone basis because:

- EE is viewed as an "Infrastructure Investment" with a low priority versus their core business;
- EE investments cannot compete for internal capital with core business IRRs;
- They are not willing to use their core business capital or credit capacity;
- Benefits from EE projects are too small to justify perceived operating complexities and risks;
- They are not convinced that the estimated savings will be realized and they are not aware of the internationally recognized M&V methods available to validate that the savings are achieved.

To make things more challenging, few ESCOs or other developers have penetrated the industrial sector due to the above sales barriers and higher credit risks versus government buildings.

However, this would likely change if ***commercially attractive*** financing was made available to ESCOs in IFC eligible countries, which would need to include some of the following major financing elements previously described in Section 1.5.

- Construction financing is made available as part of long-term financing that covers a majority of the ESCO's development, implementation and financing costs;
- No 'hard' collateral is required from the ESCO to support its savings guarantee beyond its corporate assets and the EE projects' assets, comprising primarily future cash flow from energy end-user savings payments and a rather nominal residual value of the related equipment installed;
- Repayment term of at least seven years in addition to the construction period;
- Repayment is made in local currency;
- The "all in" financing cost does not exceed reasonable market rates;
- Minimum collateral requirements for creditworthy energy end-users;
- Consistent and timely access to funding that will be sustained over a long period of time.

To achieve any notable implementation of EE projects in any IFC eligible country, an EE funding mechanism should solve as many of the above barriers for industrial energy end-users, which would include at minimum not encumbering their core business financial capacity and ensuring that the savings are measured with minimum effort and risk. The ESCO model would significantly accelerate EE projects' implementation due primarily to industrial energy end-users not having to use their internal capital. As a result, the EE funding mechanism should be structured to get ESCOs involved and thus incorporate as many of the financing elements listed in Section 1.5.

In order for an EE funding mechanism to be reasonably priced and provide attractive IRRs to investors on a sustainable basis, a significant portion (>50%) of the EE projects' implementation cost should be funded with debt from LFIs, and in a form that accommodates their general risk-adverse nature and resistance to change from traditional lending practices.

There are many mechanisms and programs that IFC could provide that would have the potential to solve one or all of the above barriers to the large-scale implementation of EE projects in IFC eligible countries. From the various EE funding mechanisms and models possible for IFC to implement, we have identified and described the following six potential recommendations which we believe have the highest possibility of resulting in a significant pipeline of EE projects within several IFC eligible countries on an accelerated basis.

2.1 POTENTIAL MECHANISMS

2.1.1 Guarantees

The single largest risk to funding EE projects in IFC eligible countries is the credit risk of energy-end users. EE stakeholders that are in the business and which have the core competency to assume this risk are LFIs. As previously stated, traditional lending practices of LFIs for EE projects typically apply an asset-based, corporate lending approach, which has them lending directly to energy end-users (as borrowers) on a full-recourse basis, with no relationship to the EE projects. The loan amount rarely exceeds 70% of total project cost and it must be supported by either a large corporate balance sheet or liquid collateral with value that minimally equals the loan amount.

Unfortunately, there is limited collateral value in EE equipment after it is installed in existing facilities due to substantial retrofit costs to remove the existing inefficient equipment and install the new efficient equipment. The typical market value of EE projects after retrofit only equates to about 10-20% of total EE project cost; thereby requiring a lot of additional collateral value or financial guarantees, beyond the EE project assets to be provided to LFIs.

There is however substantial value in the cash flow generated to the energy end-users from the EE projects created by reductions in their ongoing energy and operating costs, but often LFIs are reluctant to recognize that the cash flow will be generated from EE projects on a reliable-enough basis to help repay the related loans. It is a key success driver for ESCOs to make LFIs assign a value to the cash flow generated from the EE projects without requiring energy end-users to encumber their core business credit capacity or capital budgets to fund EE projects.

Therefore, to enable LFIs to offer project-based loans on EE projects according to their traditional lending practices and within existing credit policies for ESCOs and energy end-users, we recommend that IFC develop and offer two types of EE loan guarantees (the “Guarantees”) directly to LFIs.

The Guarantees proposed below are anticipated to be provided for the benefit of a variety of entities, which would specifically include ESCOs, EE projects, leasing companies, vendors, etc.

A critical differentiation to note is that the LFIs must have direct access to these Guarantees, which in some IFC eligible countries will require a structure different from the typical partial credit guarantees provided by IFC and other IFIs to national governments, fully backed by a sovereign guarantee. IFC must ensure that the LFIs receive the direct benefits of the Guarantees and that they are not significantly reduced or eliminated by the nation governments for beneficial use by the LFIs (like in China).

Below is a description of the two different “Guarantees” we believe are needed.

Energy End-User Credit Guarantee

Since the single largest barrier to having EE projects funded by LFIs in IFC eligible countries is the credit risk of energy end-users, we recommend that the IFC expand the credit risk coverage on its typical partial credit guarantee facility offered to LFIs and increase it to at least 50% of the total loan amount in years 1-3 and, in order to encourage longer-term loans by LFIs, increase that coverage to 75% on the back years (4-7). The credit risk assumed by IFC would be pro rata on the total debt portion of the EE projects (~50%) and would be shared with LFIs and investors.

A chart illustrating the use of an Energy End-User Credit Guarantee (EEUCG) structure is shown below.

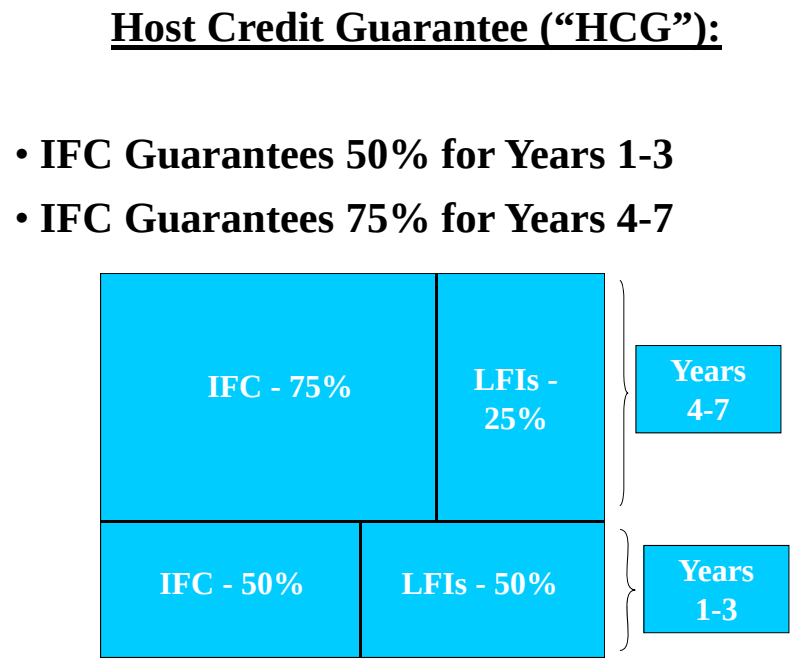

Figure 4 - EEUCG Structure

Benefits:

- Addresses credit risk assessments by LFIs;
- Addresses willingness of LFIs to offer long-term financing (~7 years);
- Ensures the guarantee flows directly to LFIs, thereby avoiding weakness in many current IFIs' partial credit risk program.

Shortfalls (on stand-alone basis):

- No prior experience to determine actual reserve requirements;
- LFIs may still not relax strict credit risk assessments and requirements beyond year 3.

Savings Guarantee

In order for LFIs to be willing to accept the cash flows from EE projects as collateral (which is really the only significant asset value in any EE project), we recommend that the IFC create a new Savings Guarantee (SG) insurance type of product that provides savings performance risk coverage to first tier LFIs that lend to qualified EE projects. For properly structured ESCO transactions, the level of SG coverage required would be very low in relation to a project's total estimated savings (<50%) meaning that achieved savings would have to be less than 50% of estimated savings before any SG coverage would apply. Based on our team's vast ESCO experience, the chances of this happening with a reputable ESCO is extremely low, which would equate to a very low risk and experience ratio for the SG product. This is especially true where the SG is managed by an experienced team of EE experts and properly securitized by the EE project contracts, cash flows and equipment and a savings guarantee from ESCOs (possibly further securitized by corporate stock of smaller ESCOs).

A unique benefit of the proposed SG is that it provides tremendous leveraging capacity because the failure of savings from an EE project to meet the debt service payments would only result in a payment from the SG fund equal to the difference between the debt service and actual energy savings for that period. There would be no default on the loan and no acceleration of loan repayment. The level of funding for a guarantee reserve account to cover this loss should only be equal to one year of projected energy savings for each qualified project. The SG reserve account would be completely depleted only if all of the EE projects in the portfolio failed to produce any savings for an entire year. This is highly unlikely (in fact, virtually impossible) if reputable ESCOs are involved and given the quality control measures contemplated to be exercised by an experienced manager, plus the remedies available in the event a call is made to the ESCOs on the guarantee reserve. The SG also offers an additional leveraging capability by being able to revolve as each qualified EE project reaches maturity. However, this revolving aspect would not begin until several years (5+) after commencement of the program.

Key components of the SG would include the following:

- Guarantee of debt service payments to LFIs to cover non-payment from energy end-users due to a shortfall in savings;
- Structured as an insurance product with fees charged to the EE projects at a sufficient level to cover all losses;
- Recognized by appropriate local credit rating agency;
- Administered with the support of highly trained EE technical staff;
- One year savings reserve providing a high leverage factor for LFIs.

Benefits:

- Removes savings (performance) risk of EE projects as a major barrier for LFIs to accept energy savings as collateral;
- Powerful marketing tool for ESCOs;
- Enables ESCOs to use the guaranteed savings model in IFC eligible countries by providing its savings guarantee to the energy end-user and not being required to take energy end-user credit risk if LFIs accept both IFC Guarantees;
- Requires minimum reserves for LFIs resulting in a high leverage potential;
- Provides a revolving and sustainable structure.

Shortfalls (on stand-alone basis):

- Does not address strict credit risk assessments and requirements of LFIs;
- Does not address willingness of LFIs to offer long-term (7+ yrs.) financing;
- Possible difficulties in funding initial cash reserves likely to be required by LFIs.

2.1.2 Special Purpose Entities

To streamline due diligence, reduce transaction costs and mitigate ESCO operational risks, we recommend that IFC promote the creation and use of Special Purpose Entities (SPEs) to aggregate the financing of EE projects whereby an SPE would own the EE projects and the LFIs would lend long-term EE financing directly to the SPE based on IFC providing the above Guarantees. Another possible scenario could be for IFC to lend directly to initial SPEs to demonstrate its use in an IFC eligible country until the LFIs become comfortable with lending to EE projects through the SPE structure.

The SPE features would include:

- Each SPE being a separate legal entity established for the specific purpose of owning the EE projects and borrowing the debt from the LFIs.
- Each SPE aggregating multiple EE projects.

A chart illustrating the use of an SPE structure to fund USD 20 million in EE projects is shown below.

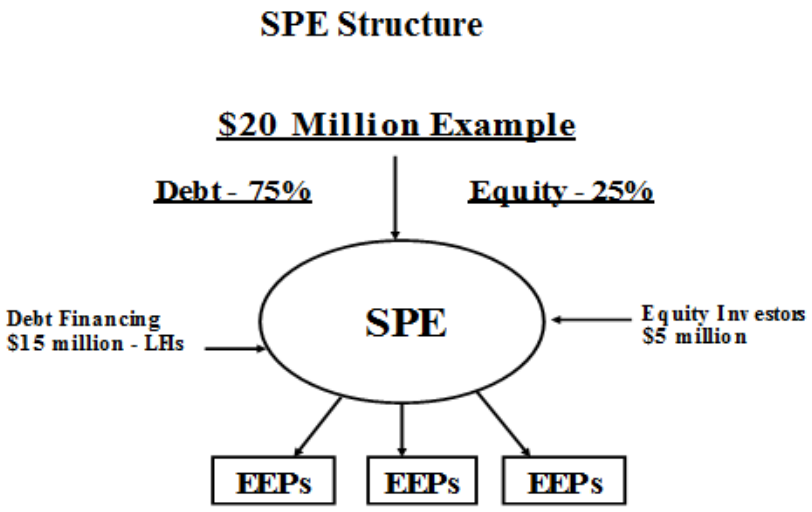

Figure 5 - SPE Structure

Benefits:

- Standardization of transaction documents and M&V protocols;
- Ability to use umbrella guarantees and loans for pool of projects;
- A critical mass of projects to attract LFIs and equity investors;
- Reduced risk by diversification through the possible pooling of projects, and in some cases cross collateralization, which is normally not incorporated into loans for EE projects;
- Isolation of EE project assets from ESCOs in case one defaults on its savings guarantee in which case, the SPE can simply hire another company to perform the ESCO's services and continue to manage the EE project without any interruption or required legal assignments. This structure significantly reduces the risk of lost savings or collateral rights versus having the EE projects owned by the ESCO.

Shortfalls (on stand-alone basis):

- Does not address strict credit risk assessments by LFIs;
- Does not address unwillingness of LFIs to offer 7-year term;
- Does not solve performance risk or collateral requirements of LFIs.

2.1.3 Utility ESCO

To leverage a national utility's market reach, financial strength and infrastructure capacity, we recommend that the IFC establish a utility-based ESCO funding mechanism in one or more IFC eligible countries that would encompass the following characteristics:

- Establish an SPE as the Utility ESCO to aggregate and finance all EE projects, as previously described.
- EE projects are developed, implemented and operated by the Utility ESCO on the shared-savings ESCO business model.
- IFC co-invests with Utility ESCO in EE projects (~30%) by providing project equity.
- IFC provides a credit guarantee to the Utility ESCO which in turn provides it to the LFI. The credit guarantee would ideally be provided to the Utility ESCO but this approach reduces the learning curve for LFIs to get comfortable with it flowing through a project-based SPE (ESCO).
- IFC provides technical assistance for training to the SPE staff on how to operate the EPC business model.
- If possible, the Utility ESCO utilizes the Utility's existing billing systems to collect savings payments from energy end-users to the SPE.

A chart illustrating this Utility ESCO structure is provided below.

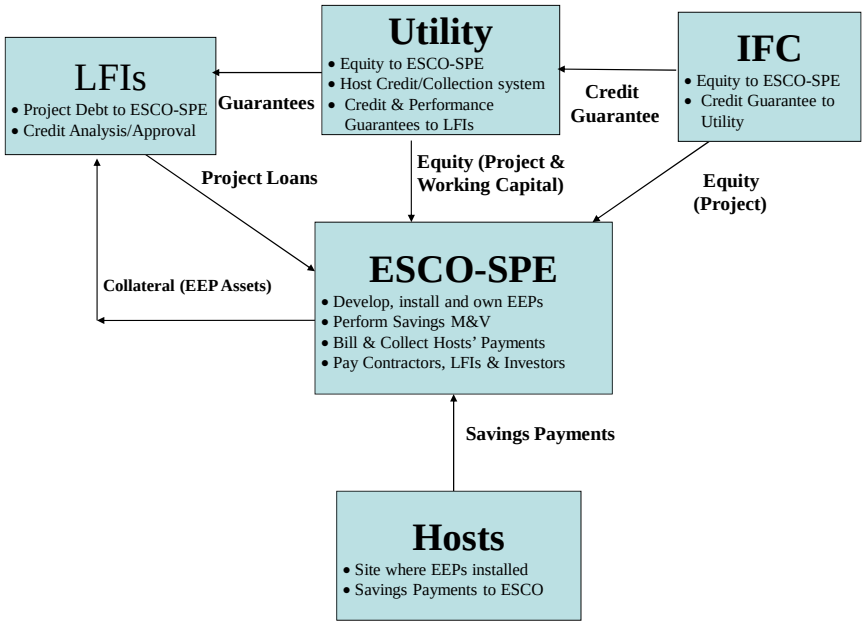

Figure 6 - Utility ESCO-SPE Structure

Benefits:

- Use of a structure that has direct access to the market, that already has a commercial relation with the energy end-user and has access to information to identify potential clients;
- An ability to leverage the Utility's brand, credibility and financial strength to build a large ESCO in an IFC eligible country;
- Implementation of EE projects that would likely include a relatively large number of industrial and commercial energy end-users that are SMEs;
- Reduced energy end-user credit risk due to Utility's bill collection assistance;

- No need for a SG from IFC due to Utility's ability to provide LFIs with adequate performance guarantees;
- Reduced transaction costs from energy end-user credit pre-qualification and ongoing collections through utility's existing billing system and database, if applicable;
- A portfolio approach could be taken on project-related risks and evaluation of savings, which could lead to simple lease or rental agreements with long-term savings guarantees.

Shortfalls:

- Difficulties identifying utilities interested in the scheme;
- The model could potentially be limited to the energy sold by the utility (electricity, gas), restraining the capacity to propose comprehensive projects.

UTILITY-BASED ESCO AS A SUPER ESCO

Super ESCOs refer to ESCOs that provide financing to other ESCOs for projects that they develop and/or buy back from ESCOs in order to free them from capital constraints. Two main types of Super ESCOs exist: (1) independent Super ESCOs and (2) utility-based Super ESCOs. Independent Super ESCOs are start-up ventures that were established specifically to pursue EPC and which later added energy supply services. Utility-based Super ESCOs are companies established by a utility company's parent (holding) company as an unregulated subsidiary to provide EE services and supply energy.

Case of the Philippines

High energy costs in the Philippines had not been enough of a driver to develop a robust ESCO market as there were only 13 participant ESCOs at the time of the idea to create a Super ESCO. The lack of development in the market was mainly due to limited access to financing, inadequate support from the Government of the Philippines and lack of awareness about EE on the part of end-users.

In 2009, the government decided to establish a Super ESCO that would support capacity development and activities of other ESCOs as well as provide new risk capital for project financing. A Super ESCO would be set up with a quasi-banking license issued by the central bank of the country, which in turn would allow it to borrow for on-lending. This type of investment would also allow for effective financing. The Super ESCO would act as an ESCO to develop and implement EE projects in the public sector and act as a Super ESCO for EE projects in the private sector. The creation of a Super ESCO in the Philippines was expected to help the development of a viable ESCO industry and be a profitable operation.

Unfortunately, due to international operational reasons, the Super ESCO never really got operational in the Philippines.

2.1.4 Major Vendors/Equipment Manufacturers as ESCOs

Major vendors/equipment manufacturers can use the EPC concept in order to increase their market through EE opportunities. Indeed, many such companies are only meeting client needs with respect to new equipment for new facilities or the replacement of equipment in existing facilities. However, very often, their products could be of interest on the basis of their EE benefits only. As these organizations frequently have a privileged access to end-users, they could use such an asset and propose dedicated EE projects to clients through an EPC approach. Such cases already exist in the case of major manufacturers such as Johnson Controls, Honeywell and Siemens. On the other hand, these companies are more focused on their EPC activities as a business opportunity, not necessarily as a possibility to sell more equipment, even if this is often the case.

Even though such huge potential does exist through an important number of vendors/equipment manufacturers, significant barriers may get in the way for IFC to find important opportunities through this concept:

- Vendors/manufacturers that do not have a wide range of equipment may be focusing on projects that are too small to justify the use of EPC due to high transaction costs.
- Vendors/manufacturers do not want to use their financial capacities to finance EE projects at client facilities. For example, neither Johnson Controls or Honeywell offers direct financing to its clients. They rather assign the debt to financial institutions. In such a context, IFC may have a hard time financing projects developed by vendors/manufacturers, not to mention that it will have to seek such opportunities through LFIs that could be interested in financing these initiatives.

It remains that due to the important size of some vendors/manufacturers and their extensive list of equipment that can generate EE, working with vendors/manufacturers may be considered by IFC as an interesting opportunity to use the EPC concept as a good vehicle for EE project implementation.

2.1.5 Captive Leasing

To leverage the market reach and financial strength of (i) a large local manufacturer of EE equipment ("**Vendor**"); (ii) an ESCO; (iii) a leasing company; or (iv) other types of EE-related companies within an IFC eligible country, we recommend that IFC establish a "captive" leasing SPE-type of funding mechanism in one or more IFC eligible countries with one or more large, local creditworthy EE Vendors, ESCOs, or technical services companies for EE projects that utilize the EPC model to pull their particular EE product or service through the market place. The key to the success of this model is to ensure the Vendor ESCO assumes a small portion of the energy end-user credit risk while assuming 100% of the performance risk. This could be accomplished by applying virtually the same structure as in the above Utility ESCO model, except that the SPE would be a leasing company ("Lease-Co") since many large Vendors (Schneider, Siemens, Johnson Controls, Honeywell, etc.) and others already have their ESCO entities established, and it would encompass the following characteristics:

- Establish an SPE as a Lease-Co to aggregate and finance all EE projects developed and implemented by the Vendor/ESCO.
- EE projects are developed, implemented and operated by the Vendor/ESCO on the shared-savings ESCO business model.
- IFC co-invests with Vendor/ESCO in EE projects (~30%) by providing project equity to the Lease-Co;
- IFC provides a credit guarantee to the Vendor/ESCO which bundles it with its own savings (performance) guarantee and provides both to LFIs.

A chart illustrating this captive leasing SPE structure for a Vendor/ESCO is provided below.

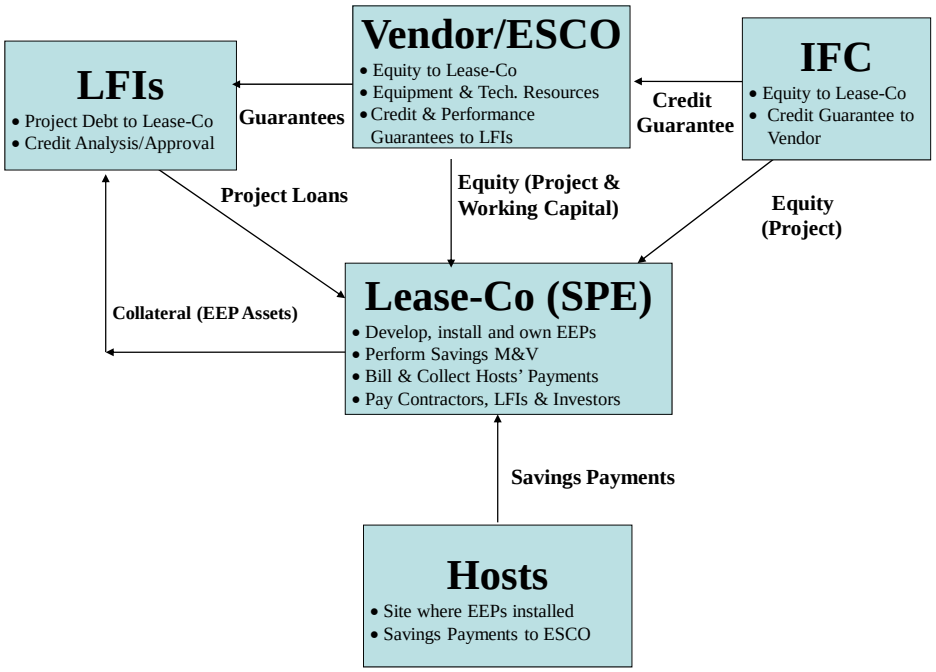

Figure 7 - Vendor/ESCO-SPE Structure

Benefits:

- An ability to leverage the Vendor/ESCO's brand, credibility and financial strength to build a large ESCO in an IFC eligible country;
- No need for an SG from IFC due to Vendor/ESCO's ability to provide LFIs with adequate performance guarantees.
- A portfolio approach could be taken on project-related risks and evaluation of savings, which could lead to simple lease or rental agreements with long-term savings guarantees.

Shortfalls:

- Potential limitation to a one-product approach, reducing the potential size of each transaction;
- The concept still has to be applied by the Vendor/ESCO on a country-by-country basis, which may limit the potential leverage of IFC.

2.1.6 Energy End-User Lending

One of the biggest problems of ESCOs is the difficulties to develop an interest by energy end-users in a new scheme. The feeling they have with such proposals is that they do not control the process and have no internal capacity to deal with the complexity of the contractual approach. In order to address this issue, IFC could approach targeted energy end-users proposing direct lending along with the necessary technical assistance in order to develop a Request for Proposals (RFP) for EPC deals from ESCOs.

This would be a straightforward deal for IFC with large (most likely international) organizations. IFC's added value to the energy end-users would be to offer the needed technical assistance to obtain a turnkey project with a full performance guarantee from a credible ESCO, which would secure their investment. The way the IFC loan would be structured could vary from a direct loan to the energy end-user to a potential direct loan to the ESCO, or even through an SPE, based on the interest of the energy end-user.

Benefits:

- Potential new offer to IFC existing clients;
- Simple approach for IFC;
- Helps generate a market for ESCOs, reducing transaction costs and long negotiation procedures.

Shortfalls:

- More work for IFC to develop the market on a case-by-case basis;
- Limits the potential aggregation of projects.

2.2 RISK ANALYSIS MATRIX

The below Table 7 identifies the risks that each stakeholder would assume for a typical ESCO project funded pursuant to each of the above IFC Recommendations. To illustrate these risks, a sample ESCO EE project is provided below which contains a typical 80% of savings payment to ESCO from the Energy End-User ("EEU) over the 7 year term of an Energy Services Agreement (**ESA**). From its 80% of savings, the ESCO must cover repayment (plus return) of its capital investment to investor and LFI , plus ongoing operating costs and a profit.

The other key assumption is that the EE project would be funded with 70% debt from an LFI

Table 7 - Energy Efficiency Project Risk Evaluation Matrix

Sample EE Project Assumptions

1. **Project Capital: $300**
   - **70% from Debt $ 210**
   - **30% from Equity 90**
2. **Term of ESA and LFI Loan: 7 Years**
3. **Annual Project Estimates:**

	$	%
• Gross Project Savings	$ 100	100%
• 20% Savings retained by EEU	(20)	(20)%
• 80% Savings paid to ESCO	80	80%
• LFI Debt Service (Principal + 9% Interest)	(40)	(40)%
• Investor Equity (Principal + 20% IRR)	(24)	(24)%
• Remainder to ESCO	$ 16	16%

TYPE & LEVEL OF RISK ASSUMED BY PARTY:

IFC Recommendations	IFC	LFI	Investor	ESCO	Energy End-User(EEU)
#1.1 **EEUCG** IFC Guarantee levels: Yrs. 1-3 = 50% of Debt Yrs. 4-7 = 75% of Debt	• **EEU Credit Risk**: **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $100** (64% Balance x 75% of Capital)	• **EEU Credit Risk:** **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $34** (64% Balance x 25% of Capital)	• **EEU Credit Risk**: **$90** (35% of Capital) • **Savings Risk** **84%** Achieved (20%-EEU;40%-LFI 24% Investor)	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to LFI + $24 to Investor)	• **Operating Risk**; - Facility - Company - EE Project
#1.2. **SG**	• **Savings Risk**: **$40** per year Guarantee to LFI	• **EEU Credit Risk:** **$210 Loan** (100% of Debt)	• **EEU Credit Risk**: **$90** (35% of Capital) • **Savings Risk** **84%** Achieved (20%-EEU;40%-LFI 24% Investor)	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to IFC + $24 to Investor)	• **Operating Risk**; - Facility - Company - EE Project

#2. SPE (with 1.1 & 1.2 "Guarantees")	• **EEU Credit Risk**: **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $100** (64% Balance x 75% of Capital) • **Savings Risk**: **$40** per year Guarantee to LFI	• **EEU Credit Risk:** **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $34** (64% Balance x 25% of Capital)	• **EEU Credit Risk**: **$90** (35% of Capital) • **Savings Risk** **84%** Achieved (20%-EEU;40%-LFI 24% Investor)	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to IFC + $24 to Investor)	• **Operating Risk**; - Facility - Company - EE Project
#3. Utility ESCO (with 1.1 & 1.2 "Guarantees")	• **EEU Credit Risk**: **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $100** (64% Balance x 75% of Capital) • **Savings Risk**: **$40** per year Guarantee to LFI	• **EEU Credit Risk:** **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $34** (64% Balance x 25% of Capital)	• **EEU Credit Risk**: **$90** (35% of Capital) • **Savings Risk** **84%** Achieved (20%-EEU;40%-LFI 24% Investor)	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to IFC + $24 to Investor)	• **Operating Risk**; - Facility - Company - EE Project
#4. Captive Leasing (with 1.1 "EEUCG")	• **EEU Credit Risk**: **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $100** (64% Balance x 75% of Capital)	• **EEU Credit Risk:** **Yrs. 1-3: $105** (35% of Capital) **Yrs. 4-7: $34** (64% Balance x 25% of Capital)	• **EEU Credit Risk**: **$90** (35% of Capital) • **Savings Risk** **84%** Achieved (20%-EEU;40%-LFI 24% Investor)	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to LFI + $24 to Investor)	• Facility & Company Operations
#5. EEU Lending	• **EEU Credit Risk:** **$210 Loan** (100% of Debt)	• N/A	N/A	• **Construction Risk**: **$300** (Completion) • **Savings Risk** **$64** per year Savings Guarantee: ($40 to LFI + $24 to Investor)	• **Operating Risk**; - Facility - Company - EE Project

3 IFC ESCO-RELATED OPPORTUNITIES

3.1 KEY ESCO PLAYERS

It is impossible to know all organizations that are operating as an ESCO or claim to be operating as an ESCO on a global basis. Not only are there likely too many ESCOs but this is an evolving time for the EE market, which several new players are entering.

Based on our current knowledge of the market, we are developing a list of ESCOs and opportunities that could be of interest to IFC in the context of its interest to use ESCOs as a potential vehicle to develop the EE market.

3.1.1 Global ESCOs

On a global basis, some international organizations have positioned themselves as ESCO players in different markets. Even though they have the technical capacities to develop and implement projects under an EPC model, they have elected to focus on specific countries. All of them are not interested in providing direct financing for projects but have developed a capacity to develop financing for their clients, at least in some countries. Most of them are quite present in the most active markets in developed countries (North America, European Union) but only in a few IFC eligible countries based on their own interest, regardless of whether they have local offices. One exception to this would be ABB, currently supported by Econoler to enter the ESCO business worldwide, mainly in the industrial sector.

In the following pages, we are presenting references to such ESCOs and information that could be used by IFC to get a first contact with these organizations:

ABB:

Jim Kelly
Group Vice-President - Head of Energy Efficiency Regional ESCOs
ABB Group
3700 West Sam Houston Parkway South, Suite 600
Houston, TX 77042
USA
Tel.: (281) 630-9137
Fax: (713) 266-4360
Mobile: (281) 630-9137
Email: jim.e.kelly@us.abb.com

Ameresco:	Andrew Rubin Director - Business Development Ameresco 34 Buck Hill Road, Madison, Connecticut 06443 USA Tel.: +203 (421) 7909 Fax: +203 (779) 1044 Mobile: +203 (214) 1777 Email: arubin@ameresco.com
Danfoss Solutions A/S:	Johnnie Rask Jensen President of Danfoss Solutions Birkemose Allé 33 DK-6000 Kolding Tel.: +45 7488 7100 Fax: +45 7488 7101
Honeywell:	Scott Petersen Marketing Director - Energy Solutions EMEAI Honeywell House Arlington Business Park, Bracknell, Berkshire RG12 1EB Tel.: +44 (0) 1344 656000 Fax: +44 (0) 1344 656907 Mobile: +44 (0) 7855 308989
Johnson Controls:	Gerrit J. Reinders Director Global Energy & Sustainability Programs, Building Efficiency Johnson Controls 507 E. Michigan St. P.O. Box 423, Milwaukee, WI, 53201-0423 USA Tel.: (414) 524-7331 Fax: (414) 524-4336 Mobile: (414) 520-7457 Email: gerrit.j.reinders@jci.com

Schneider Electric:	Cécile Vercellino PEC - Data Center Segment Manager Schneider Electric Power EMEAS S2 Plant - 20 avenue des Jeux Olympiques 38000 Grenoble France Tel.: +33 (0)4 76 57 62 39 ext. 34 62 39 Mobile: +33 (0)6 77 12 92 91 Email: cecile.vercellino@fr.schneider-electric.com Sami Siltainsuu Energy Services Manager, EMEA - Buildings Business Schneider Electric Kellokukantie 2 FI-01300 Vantaa Finland Tel.: +358 (9) 5842 500 Mobile: +358 (50) 385 3366 Email: sami.siltainsuu@buildings.schneider-electric.com
Siemens:	Bob Dixon Vice President – Global Head - Efficiency & Sustainability Building Technologies Division 1000 Deerfield Parkway Buffalo Grove, IL 60089 Tel.: +1 847 941 5070 Fax: +1 866 699 0124 bobdixon@siemens.com

3.1.2 National ESCOs

On a national basis, ESCOs can be found in many countries. The most important markets as far as emerging ESCOs are concerned can be presented as follows:

- Brazil
- China
- Czech Republic
- India
- Mexico
- Thailand.

Based on our detailed knowledge of the ESCO market in Brazil, China and India, we are presenting in the following sections the most active national ESCOs (not affiliated with any of the global ESCOs mentioned before) that could potentially fit the profile that is of interest to IFC:

Brazil

AÇÃO	José Starosta Av. D. Pedro I, 656 - Vila Monumento 01552-000 São Paulo Phone (11) 3883-6050 / 9985-8536 Email:jstarosta@acaoenge.com.br
ACE	Oscar de Lima e Silva / Frederico Peiró Rua Professor Artur Ramos, 183 - cjto 12 - Jardim Paulistano 01454-010 São Paulo Phone: (11) 3034-3995 / 3037-7922 /3031-1749 Email: ace@energiaracional.com.br
DALKIA BRASIL S/A	Francisco Dal Rio Rua Funchal, 418 - 14º andar 04551-060 Vila Olímpia Phone: (11) 4083-0003 / 4083-0007 Email: fdalrio@dalkia.com.br
ENERGIAS	Alexandre Sedlacek Moana Rua 24 de Maio, 225 - cjto 10 – Centro 01041-001 São Paulo Phone: (11) 3333-5693 / 3331-4305 Email: alex@energias.com.br
MCPAR	Cyro Barbosa Bernardes Av. José de Souza Campos, 1815 - cjto 511/512 – Cambuí 13025-320 Campinas Phone: (19) 3254-7699 Email: cyro@mcpar.eng.br

MGD	Norberto Nunes Duarte Rua Dona Ana Pimentel, 157 05002-040 São Paulo Phone: (11) 3864-3755 Email: mgd@mgd.com.br
NEWMARENERGIA	Newton Figueiredo Al. Santos, 2223 - 3° andar 01419-002 São Paulo Phone: (11) 3062-5031 / 3062-1910 / 9440-4747 Email: info@newmarenergia.com.br
TERMOCOP	Rafael Milanés Avenida Jorge Tibiriça, 1194 Jardim das Oliveiras 13044-125 Campinas Phone: (19) 3276-6312 / 3271-7439 Email: rafael@termocop.com.br
VITALUX	Eduardo Moreno Rua Tagipuru, 235 - 7° andar Barra Funda 01156-900 São Paulo Phone: (11) 3665-9451 / 3665-9455 Fax 3661-0767 Email: emoreno@vitalux.com.br
GESTAL	Rua Borges Lagoa, 190 Vila Clementino 04038-000 São Paulo Phone: (11) 5084-8200
EFICEL	Rua do Café, 208 Centro 12010-330 Taubaté Phone: (12) 3632-2132 Email: contato@eficel.com.br

LIGHT ESCO	Marco Antonio Donateli Av. Marechal Floriano, 168 DG - 2° and - corredor C Centro 20080-002 Rio de Janeiro Phone: (21) 2211-2733 Email: mario.javaroni@lightesco.com.br
EFFICIENTIA – CEMIG	Claudio de Oliveira F. Latorre Av. Afonso Pena, 1964 7° andar 30130-005 Belo Horizonte Phone: (31) 3273-6139 / 9951-0389 Email: latorre@efficientia.com.br
APS	Aldemir Spohr Rua Felipe de Oliveira, 500 cjto 501 Santa Cecília 90630-000 Porto Alegre Phone: (51) 3378-3838 / 9965-0048 Email: aps@apsengenharia.com.br
ECOLUZ	Ricardo da Silva David Av. ACM, 1116 Tropical Center sala 102 41800-700 Salvador Phone: (71) 2108-9200 / 2108-9289 / 71 9114-9113 Email: ricardodavid@ecoluz.com.br

China

Energy Technology Company Ltd.	Nengfa Weiye Room 3105, Block C, 390 Qingnian Avenue, Heping District, Shenyang, PRC, 110003 Phone: +86 24-85631159 Emailinfo@nfenergy.com
Leasing Company Ltd.	Shandong Rongshihua Beijing Project Department: 010-62227226 Project Development Dept.: 0531-81211379

Environmental Energy Technology Group Co., Ltd.	Beijing Shenwu Phone: 010-60751999 Email：sw@shenwu.com.cn
Energy Saving Technology Co., Ltd.	Beijing Yuanshen Phone: 010-88131055, 88131056
Hangzhou Energy Investment and Management Co., Ltd.	Phone: 0571-88477884 88477918 89938100 Email: hzeim@163.com

India

SeeTech Solutions	Mr. Milind Chittawar, CEO 11/5, MIDC InfoTech Park, Near VRCE Telephone Exchange South Ambhazari Road , Nagpur – 440022 Phone: 0712-2222177, 09422145534 Fax: 0712 – 2225293 Email: chittawar@satyam.net.in
Intemo Systems Ltd.	Mr. K. Satyanarayana, Managing Director B23/A, II floor, Kushaiguda Electronic Complex, ECIL Post, Hyderabad - 500062, Andhra Pradesh Phone: 9000881339, 9000781339 Email: jrbhavaraju666@gmail.com intemoindia@yahoo.com
Pranat Engineers Pvt. Ltd.	Mr. Akash Jain 28, Rishabh Vihar, Karkardooma, Delhi – 110 092 Phone: +91 11 22372828 / 22373565 Fax: +91 11 22375994 Mobile: +91 9810160265 Email: akash2316@gmail.com

Wipro Eco Energy
Snehil Taparia
Sustainability Consultant
5th Floor, SB Towers, 88 MG Road, Bangalore, Karnataka (560001)
Phone: +91 80 41994000
Fax: +91 80 2212 7652
Mobile: +91 7760967956
Email: snehil.taparia@wipro.com

Customised Energy Solutions
Mahesh Patankar
Director – Market Innovations (Asia)
Level 1, Trade Center
Bandra Kurla Complex
Bandra (East); Mumbai 400 051
Mobile:+91.98202.25248 (India)
Mobile:+1.215-385-4256 (USA)
Email: mpatankar@ces-ltd.com

3.2 POTENTIAL INDIVIDUAL OPPORTUNITIES FOR IFC

In the following sections, different opportunities that could be considered by IFC are presented. These opportunities are not presented in an equal manner, sometimes with some details, sometimes with just information on organizations that could contacted by IFC to see whether something could be done with them to help trigger their ESCO activities.

3.2.1 Philippines

First Pacific is a majority shareholder for key utilities in the Philippines such as MERALCO, the Philippine Long Distance Telephone Company (PLDT) and others (including toll ways). MERALCO is the largest private electric utility in the country distributing electricity to more than 60% of the country.

It has strategic subsidiaries including MIESCOR (industrial engineering service provider), MERALCO ENERGY, Inc. (utility ESCO) and MERALCO PowerGen Corp. (renewable energy service provider). PLDT is the largest telecommunications utility with nearly USD 1 billion annual profits and having multiple fairly large-sized office buildings in the country. MERALCO is an ideal partner considering its access to a huge base of customers (commercial and industrial). Since PLDT and MERALCO belong to First Pacific as parent company, demonstration ESCO projects in PLDT buildings are quite accessible. First Pacific diversifies its investments and, at this point, MEI may not be a priority under its investment portfolio considering that the market is not seen as being mature yet. IFC is in a unique position to take leadership in catalyzing greater investments showcasing its product portfolio. An IFC equity or venture capital investment through Sustainable Energy Fund (SEF) partner LFIs will raise the profile of MEI with equity, debt and equity-linked security that can also be leveraged to other LFIs. MEI

can be a strategic aggregator of EE projects for the private sector upon successful implementation of targeted PLDT demonstration projects. Once listed through initial public offering, MEI can be developed as a Super ESCO that will support other ESCOs for both private and public sectors. A portion of the funds from IPO may also be used to buy out repayments to be contracted with EE product vendor alliances such as Danfoss, ABB, Carrier, TRANE, etc. MEI will be in the best position to tap the public accounts also through other ESCOs on shared-savings EPC and/or through other LFIs on guaranteed savings EPC. In such an upscale position, the guaranteed savings EPC concept may be adopted whereby LFIs like Bank of the Philippine Islands (BPI) and Banco de Oro (BDO) are prepared to extend loans to public accounts under their SEF agreement with IFC. As a Super ESCO, other future services that MEI can extend may include equity investments, other ESCO venture capital, equipment leasing, carbon credit aggregator & credit guarantee facility. Technical assistance needed include capacity building on IGAs, M&V, EE financing, business planning, market development, project design & implementation, carbon finance – CDM and carbon credit development. Econoler is currently coordinating the concept with IFC Philippines.

Key Contact Persons:

MIESCOR/MEI	Jesus P. Francisco President Phone: +63.2.633.5119 Email: jpfrancisco@miescor.net
MEI	Victor Baylosis Managing Director Phone: +63.2.631.7275 Email: vbaylosis@meralcoenergy.com
BPI	Nanette Biason Assistant Vice President Phone: +63.2.845.5855 Email: nabiason@bpi.com.ph

3.2.2 Chile

Fundación Chile (FC) is a non-profit private corporation whose partners are the Government of Chile and BHP-Billiton – Minera Escondida. It aims to introduce high impact innovations and empower human capital in order to increase Chile's competitiveness. FC provides technical advice and consultancy services in a number of areas including climate change, sustainable development, EE and RE. It is involved in a number of EE/RE initiatives in Chile.

Gerens Capital S.A. (GC) is a financial management company dedicated to the structuring and management of private investment funds. It is at the forefront of innovative investment schemes in the industry of investment funds in Chile. It is a subsidiary of Gerens S.A.

The group has over 16 years of outstanding track record in advising companies and public and private institutions, both in Chile and abroad. Other companies in the group specialize in advisory services, administration and evaluation of funds, project evaluation and selection, control and management of investments, financial restructuring, valuation of portfolios, etc.

FC, in partnership with GC, pursue the establishment of Chilean Ecoefficiency Fund – a dedicated investment vehicle targeting the market of EE and RE projects in Chile. The fund is a "close-end" facility with a 10-year cycle. In the first five years ("build-up" period), it will build its project portfolio and in the second five years ("cool-down" period), it will only manage the existing portfolio until the full repayment of the loans. The facility will target a market niche with a very high potential and very little competition from other financing institutions. The terms of the facility are as follows:

Equity	USD 3,000,000
Debt	USD 10,000,000
Instrument & Valuation	Investments will be made by way of equity and loan. The equity investor will enjoy an IRR of around 22.00%.
Business Model & Management	The fund will provide loans with tenor up to seven years for EE and RE projects in Chile. The primary target will be EE projects in three main sectors: large industrial EE, financing of ESCOs, financing of public sector EE. FC will provide support for the technical evaluation and monitoring of projects. GC will be responsible for managing the financial aspects of the fund, including front office and back office operations, financial evaluation of projects, risk assessment, management of undisbursed funds and day-to-day operations.

Key Contact Person:

Fundacíon Chile
Ana María Ruz
Director Sustainable Energy
Phone: + 56 (2) 2400 455
Mobile: 99188238
Email: aruz@fundacionchile.cl

Gerens S.A.
Patricio Arrau
CEO
Phone: +56 (2) 235 9890
Email: parrau@gerens.cl

4 OPINION/OBSERVATIONS ON KEY FOCUS AREAS FOR IFC

As seen throughout this report, the opportunities for IFC to work with and through ESCOs in order to stimulate the EE market in IFC eligible countries are numerous but not easy to identify. The need for adapted financing is one of the biggest barriers to the use of the EPC concept, even for international global organizations interested in working in such IFC eligible countries.

IFC will always find it difficult to develop opportunities on a case-by-case basis because of its specific nature (small size of projects, small organizations acting as local ESCOs). Consequently, there is a critical need for LFIs in IFC eligible countries to develop a better understanding of how EE projects generate new cash flow from existing operating expenses. Additionally, LFIs in IFC eligible countries need to create increased credit capacity for energy end-users to repay the related loan and, therefore, gain interest in developing a business related to financing ESCOs and ESCO-related projects. To fill this tremendous void, we recommend that IFC provide technical assistance funding to offer training to LFI staff on standardized techniques and procedures (a protocol) for evaluating and financing EE projects. Doing so could be linked to financing opportunities that would enable IFC to work through intermediaries that could be in a better position to address the numerous opportunities available in a national or regional market, thereby aggregating opportunities and developing long-term opportunities with local ESCOs while using IFC financing at a level and under conditions acceptable by both parties.

The IFC has developed a of EE finance training materials and tools that it has used to build EE lending capacity with its participating banks and partners. Efficiency Value Organization (EVO) has developed developed a practitioner-based EE lending capacity building workshop called the International Energy Efficiency Protocol (IEEFP). The IEEFP is geared toward training the lending and credit officers of LFIs on how to evaluate the risks and benefits of financing performance-based EE projects. There could be some real value in comparing the two training programs and if merited, combining the two to arrive at a standard EE training workshop for LFIs around the world.

Alternatively, assuming, as it is frequently the case, that LFIs cannot find the interest in such markets, IFC could consider setting up its own fund or specific financing mechanism in a country and work through a performance-based fund manager to offer the needed financing for ESCOs and ESCO projects. The presence of high-level experts in such fund management organizations would enable these funds to mitigate their operational risk and make such an investment attractive. Even though examples for such an approach are limited, some, like the Bulgarian Energy Efficiency Fund, have demonstrated that this approach might be the best current alternative in many countries as LFIs are just not interested in developing such markets in an effective way.

APPENDIXES

APPENDIX 1 – MR. TOM DREESSEN DISCLOSURE OF PAST ENGAGEMENTS WITH IFC

From 2008 to 2010, Mr. Dreessen had discussions and met with various IFC staff regarding its possible 'fund of fund' investment in his proposed new EE fund which was going to invest in EE projects implemented by ESCOs in China. These discussions led to his company, Energy Efficiency Project Investment Company Limited, executing a mandate letter with IFC in November 2009 to conduct due diligence on its possible investment. IFC decided not to invest in the fund and all related discussions between EEPIC and IFC terminated approximately nine months ago.

APPENDIX 2 – ESCO AND EPC MODELING

In mature markets, ESCOs are sophisticated EE project developers responsible for an unusually wide spectrum of tasks: they identify, design and finance each project; install and supervise the maintenance of most of the equipment installed; measure and monitor the project's energy savings; and assume the risk that the project will reduce the energy end-user's energy and operating costs at a sufficient level to repay the investment. Like most developers, ESCOs distinguish working capital from project financing. Working capital is used for general corporate purposes and the front-end development of projects prior to construction, and project financing is used to pay for the ESCO's cost to implement the project (includes development, design, equipment, local contractors and ESCO markup). Project financing is further divided into construction and long-term, the former construction financing is used to pay for the project implementation, which is later converted to long-term financing when the project installation is complete and commissioned.

ESCOs must perform a rigorous M&V effort on the energy savings, which includes ongoing monitoring over the project's financing repayment term in order for the ESCO to be willing to take the risk that the savings will be sufficient to repay the investment. Measurement essentially means ongoing verification of energy savings, sometimes by periodically comparing an energy end-user's energy bills against an established pre-project baseline, or by performing a direct measurement of the "before" and "after" energy utilization for a specific technology installed. The performance of an ongoing M&V not only ensures that the project's savings have been achieved, but that they will persist by monitoring the quality and effectiveness of ongoing maintenance, which is the key to sustained efficiency. More importantly, it is the key to being able to manage the return on investment for EE projects.

The difficulties inherent to EPC, which are depicted by an impressive number of recognized figures in their respective countries that have contributed to this effort, could have discouraged many embryonic efforts to start up ESCO operations in most countries. The absence of support, favorable legal frameworks or limited financing constituted major barriers and could have defeated young and emerging ESCO industries. Sometimes governments were there to help. Too often, they were major hindrances - either unwittingly or deliberately.

But ESCOs offer a good thing – eliminating many of the traditional barriers for EE projects through reduced operating costs without capital expenditure to industry, and skills that freed up critical money for institutions such as schools and hospitals. Indeed, the single greatest benefit of the EPC model is the ease of selling it to energy end-users because of the "no risk," "no investment" and "paid-from-savings" proposition. The shared-savings structure is the most beneficial to energy end-users because they assume neither risk nor any obligation to repay the lender (thereby not impacting their lending capacity) and nor to pay the ESCO if there are not sufficient savings to pay the debt service. The EPC model also benefits energy end-users by eliminating technology risks versus doing it themselves because the ESCO provides engineering-based savings and financial pro-forma estimates, the

majority of which they are willing to guarantee. Another benefit is that many EE projects include infrastructure-related improvements that need to be made anyway by the energy end-users, which results in the latter being able to eliminate or reduce their internal capital budget for these investments.

Gathering information and making comparisons of ESCO markets in different countries is limited by the fact that the notion of an ESCO is understood differently from one country to another, and sometimes used differently by experts even in the same country. The same can be said about energy performance contracting. But we believe that most experts could agree on the following definitions:

An **ESCO** is a natural or legal person that delivers energy services and/or other EE improvement measures in an energy end-user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of EE improvements and on the meeting of the other agreed upon performance criteria.[10]

EPC is a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an EE improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of EE improvement.[11]

TPF and EPC are terms used to cover a wide variety of contracting and financing techniques for EE and RE projects. The terms used, and the financial and contractual approaches they imply, may differ but the essence of each of these approaches is similar.[12]

Other organizations, such as energy service providers, may offer the same service but do not offer the guaranteed results, making them quite different from ESCOs.

EPC continues to change and evolve. Still, ESCOs typically develop, implement and fund their projects on a turnkey basis by bundling the following services:

- IGAs
- Comprehensive engineering design
- Project financing
- Complete installation and commissioning
- Long-term performance guarantees
- Savings measurement & verification (IPMVP)
- Ongoing equipment maintenance.

[10] S. Hansen, P. Langlois and P. Bertoldi, "ESCO Development," ESCOs Around the World, 2009, Chapter 1.
[11] Ibid.
[12] Energy Charter Secretariat, "TPF/Energy Performance Contracting – from theory to practice," Third Party Financing – achieving its potential, page 6.

Services are more sweeping and financial models are more flexible. ESCOs today offer a broad range of retail energy services, including:

- Engineering feasibility studies, audits and IGAs
- Equipment acquisition and installation
- Load management
- Energy purchase negotiations
- Facility management and water management
- Risk management
- Automated meter reading
- Energy information management
- Training and awareness services
- Sustainability support and environmental compliance
- Measurement and verification of savings
- Guaranteed results.

With some minor modifications, the shared-savings model is currently practiced in Europe and to a lesser extent in North America.

Shared Savings

For about 10 years, shared savings was the only type of EPC offered by North American (U.S. and Canadian) ESCOs. This structure creates a lot more risk for the ESCO than guaranteed savings because the ESCO not only assumes the project performance risk but also assumes the energy end-user credit risk. The shared-savings approach typically requires an equity investment (especially in IFC eligible countries), which in combination with the higher risk assumed by the ESCO carries a higher capital cost than the guaranteed savings structure.

The primary characteristics of shared savings can be summarized by the following:

- The energy end-user and the ESCO share a predetermined percentage of the energy cost savings;
- ESCOs carry both the performance risk and the credit risk;
- Financing for energy end-users does not negatively impact their credit capacity and can be off balance sheet;
- The equipment is “owned” by the ESCO for the duration of the contract (ownership is usually transferred to the owner at contract end);
- Increased risks associated primarily with energy end-user repayment causes the cost of money to be higher. As the entire project payments are recognized as a service cost, they are fully deductible for tax purposes in many countries for the duration of the agreement.

The economic viability of shared savings rests on the price of energy. As long as energy prices stay the same or go up, the project will typically pay for itself.

Guaranteed Savings

In developed markets, energy end-users have been interested in the model where the ESCO provides a performance guarantee to them, i.e., that the realized project savings will be able to cover all the related project costs, including debt service to the lender, M&V fees to the ESCO and any other incremental costs (maintenance, etc.) incurred by the project, over a certain period of time. If the achieved savings fall short of the ESCO guaranteed savings amount, the ESCO will reimburse the energy end-user for such shortfall. If the realized savings exceed the guaranteed savings amount, the ESCO may share a portion of the excess, with the amount depending on the risk taken and the extent of ongoing services provided by the ESCO.

The significant characteristics of guaranteed savings can be summarized by the following:

- The amount of energy saved is guaranteed, as long as the operation remains similar to the period preceding the project implementation;
- Value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price;
- Owners carry the credit risk;
- Risks to ESCOs are lower than with shared savings;
- Less of the project investment goes to financing costs;
- Tax exempt (MUSH) institutions in countries that provide for this tax provision can use their legal status to access lower interest rates (in the case of the U.S.).

“Chauffage”

Following the patterns that evolved in the telecommunications industry, ESCOs are showing an increasing tendency to unbundle and bundle these services, offering several or all of the abovementioned to energy end-users. Ultimately, ESCOs are apt to be selling conditioned floor space, which will provide ESCOs and energy end-users with a more effective and efficient means of guaranteeing the return on investment. Such an advent would bring us full circle back to the first EPC agreement developed in Europe: “chauffage” - an integrated supply/use efficiency solution.

In this type of financing agreement, the management firm guarantees that the facility owner's energy costs will be lower than they would have been without an energy performance contract. The ESCO assumes responsibility for paying the energy bills of the facility over the term of the agreement. The facility owner pays the ESCO a specified percentage of the previous energy costs (per energy unit consumed, per square footage, etc.) that would have been incurred, discounted from an agreed base year of energy costs (e.g., historical energy costs minus a discount of up to 15%).

The base year is developed and agreed to by both parties at the time of contract signing taking into consideration use, occupancy, unit energy costs and many other factors affecting total energy costs.

A chauffage contract is usually very extensive, often involving a thorough energy management plan, including retrofits and maintenance. It is generally considered appropriate only for large-scale energy end-users whose facilities feature substantial potential savings (e.g., hospitals, universities and large office buildings). This kind of agreement is often used in Europe to contract municipal services. The length of a chauffage contract is usually long, ranging from 10 to 25 years.

From the payments received, the ESCO must recover all of its expenses for equipment and services as well as pay the energy bills. The ESCO's gross margin is derived from the difference between the payment it received from the customer and the reduced energy costs it pays to the utility. The ESCO must reduce actual energy costs significantly below what it charges. Its profit equals this gross margin minus the costs to design, install and maintain the retrofits.

The facility owner is able to budget utility costs with absolute certainty throughout the term of the contract and is assured of a positive cash flow during the term. This cash flow would most likely be less than that in a shared-savings arrangement as the ESCO assumes more risk. As in a shared-savings contract, the facility owner would have little incentive to invest in savings without a separate energy use 'score' being kept. Hence, there is a tendency to opt for lower capital cost improvements.

In practice, ESCOs using the chauffage concept sometimes focus only on supply-side efficiencies and refer to the contract as "chauffage." It may include some type of ownership of a part, or the totality, of HVAC systems by the ESCO. The contract typically provides for some means of making adjustments for energy prices on an annual basis.

On a financing basis, financing is done through the ESCO whereby the financing institution takes the long-term contract with a strong client as the main collateral for the loan.

EPC Models - Contrasted[13]

While shared savings remains the dominant model in Europe, in North America over 90% of the EPC agreements are currently structured for guaranteed savings with the owner typically accepting the debt through TPF.

The guaranteed savings scheme is likely to function properly only in countries with an established banking structure, a high degree of familiarity with project financing and sufficient technical expertise within a banking sector that understands EE projects. The guaranteed savings concept is difficult to use in introducing the ESCO concept in developing markets because it requires energy end-users to assume investment repayment risks for unknown technologies. However, it fosters long-term growth of

[13] All this section has been mainly taken from "A Guide to Energy Service Companies," Carry Bulock and George Caraghiaur.

ESCOs and finance industries because it enables newly established ESCOs with no credit history and limited capital resources (unable to invest in their projects) to enter the market if they are willing to guarantee the savings to energy end-users who will secure the financing on their own. In the U.S., the guaranteed savings model evolved from the shared-savings model in response to energy end-users' desire to significantly reduce interest costs in exchange for accepting more risk due to their increased comfort with energy savings technologies. It also was initiated by smaller ESCOs and fostered by financial institutions to allow them to grow their respective industries. The primary benefit of this structure is that it significantly reduces financing costs for the U.S. Municipalities, Universities, Schools and Hospitals (MUSH) market by utilizing their tax-exempt status. A requirement is that the tax exempt (MUSH) entity must be the borrower, which is backed up by the ESCO guarantee. This reduced financing cost enables a lot more project investments to be made for the same debt service level. The public sector normally prefers this structure in order to maximize the amount of infrastructure investments made in its facilities from a performance-based contract.

The shared-savings concept is a good introductory model in developing markets because energy end-users assume no financial risk, which overcomes the difficulty energy end-users in transitional economies have in satisfying banks' criteria for creditworthiness. Another reason is the fact that a new concept, such as EPC, is easier to establish in a country if the energy end-user does not have to incur debt, or can avoid incurring going through the political/legal procedures to do so. The shared-savings concept, however, relies heavily on ESCOs' borrowing capacities and this presents a serious difficulty for small and even big ESCOs which lack access to financial resources. After incurring debt on even a limited number of projects, an ESCO is apt to find it is too highly leveraged to obtain financing for the implementation of more projects. This is a key factor in hampering industry growth. It essentially forces the ESCOs to have to continually raise substantial amounts of equity to grow resulting in balance sheets that more resemble banks and leasing companies than what they are, service companies. The shared-savings concept therefore limits the long-term market growth and competitiveness of small ESCOs and leaves lots of "lost opportunities" in energy end-user facilities because of its high financing costs only allowing short payback measures to be implemented ("cream skimming").

The "chauffage" approach works well in countries where a lot of heating (or alternatively cooling) loads are present, as it is quite focused on internal supply side EE. It is often associated with transfer of obligations related to the operations and maintenance of a facility where energy savings are just one component of the full deal. The approach is often seen in Central and Eastern Europe in the context of municipal district heating plants.

Which Approach is Best?

There are important questions to ask when selecting among these different financing approaches. On whose balance sheet are the project assets? Who is really at risk for project performance? Is the financing project-specific? Why should one care about the questions? We already know that off-balance sheet financing preserves a customer's access to capital and simplifies project approval by an organization. With respect to risks, we have seen that in pay from saving, shared-savings and

"chauffage" contracts, the ESCO takes the savings risks head-on. In guaranteed savings, the customer guarantees to repay the debt obligation undertaken to build the project and the ESCO indemnifies the customer for taking this risk by giving a guarantee that the savings necessary to make the payment will be met. What is the difference if the ESCO takes the risk or the customer takes the risk and is indemnified? As we have seen, in the event that the savings are not met and the ESCO goes bankrupt, the customer may still have to pay the debt. In the worst case scenario, the extent that ESCO contracts are used as collateral for ESCO debt, creditors may be able to avail themselves of the contract rights under those contracts and have the customer pay them directly. However, the customer clearly has a much more secure position in shared savings, compared to guaranteed savings and "chauffage" contracts. For this reason, these contracts are generally more costly.

Whether the financing is project-specific or not is a risk diversification issue. When financing is specific to a project, repayment of the financing may be predicated on the receipt of specific streams of revenue. For example, if a project is financed by a general revenue bond, it does not matter whether the project performs. The bonds still have to be repaid, regardless. Most energy performance contracts are financed with project-specific financing and payment is predicated on project performance. If these projects fail to perform, even if related projects do perform, the ESCO may not be repaid. If financing is not project-specific, the cost of capital for a specific energy end-user is usually lower because of risk diversification.

Future Model Approaches

For years, ESCOs have largely ignored or done little work in many markets, such as large residential real estate properties, small commercial and industrial facilities, and small residential.

ESCOs usually shy away from large residential and commercial projects owned by limited partnerships and highly leveraged. They do so because of credit issues. ESCOs are successful in arranging long-term project financing that is non-recourse to them by assigning contract rights to lenders. However, large residential and commercial project owners have all their collateral pledged to their lender and the ESCO is often unable to get a first security interest in the equipment it would install for these owners. Since the sole collateral for ESCO financing is generally the contract rights in the equipment installed, such a financing structure is difficult to develop when the ESCO has no clear ability to claim the equipment of the energy end-user if it fails to honor the contract. This type of credit issue is not present with large public sector residential projects that carry government agency guarantees.

Leases and other non-recourse financing vehicles used by ESCOs typically have a very small component of equity. Lenders can be comfortable with such large leverage for three reasons:

- First, they screen the people they lend to, and they lend only to people they believe will have no trouble paying them back.
- Second, the terms and conditions of their contracts strongly favor them in the event of the energy end-user's default.
- Finally, they often diversify credits by either pooling them or syndicating them.

Consequently, it is easy to understand why highly leveraged large residential and commercial properties are not generally appropriate for these types of financing vehicles. One answer would be to use financing vehicles that have a much higher blend of equity (30% to 50%), and have terms and conditions that provide the lender of the other 50% to 70% reasonable security even in the event of a partial default by the energy end-user. Several ESCOs have used these types of vehicles with some success and they are likely to become more common as more ESCOs target the considerable project opportunity available in these sectors. It is unlikely that this approach will be commonly used in the future for several reasons. First, it is more costly and complex. Second, as more investment property is moved into real estate investment trusts they become more financeable. Finally, as owners realize the effect which increasing net operating income has on overall asset value, they will be more willing to invest their own funds.

In the large residential sector, one method to facilitate financing is to use the utility bill for collection, with the long-term obligation migrating with the ownership. PacifiCorp in the U.S. pioneered using the utility bill to collect payments for ESCO services in its FinAnswer program many years ago. Under this program, the utility implemented and financed facility improvements. It then billed the occupant over many years for the work, including interest. In the event that the property was sold, or changed hands, the obligation either had to be paid off before the sale or the obligation moved to the new owner. The ultimate recourse, of course, was that the utility could cease supplying power. There were no significant defaults by the energy end-users under that program.[14] Hence, use of the utility bill as a collection mechanism is seen as improving the credit quality of the energy end-users. Today, many competitive energy providers realize the benefits of putting these items on the energy bill and are adopting this innovative approach.

ESCOs have traditionally not targeted small commercial and industrial facilities and small residential properties because transaction costs make projects in this sector uneconomic. The transaction costs associated with residential and small commercial energy end-users can be reduced if credit pre-qualification is simplified and if credit and performance risk can be treated on a portfolio basis. Credit pre-qualification could be simplified to only consist of reviewing data already collected in electronic format by someone else. Portfolio risk can be taken on a portfolio basis if very few customers actually require that their particular project be evaluated for savings. These types of transactions might look like either simple lease or rental agreements with long-term savings guarantees. For example, an ESCO might provide an appliance and guarantee the related savings.

[14] Private conversations with PacifiCorp personnel.

Savings may be based on a typical use installation that the ESCO maintains for future inspection and proof to consumer watchdogs. Alternatively, an ESCO may agree to measure and demonstrate the savings on the actual equipment of the energy end-user with the provision that if the savings are confirmed, the customer pays for the assessment while if the savings are not confirmed, the ESCO not only pays for the assessment but also makes a cash settlement representing the benefit which the ESCO had guaranteed to provide. Such arrangements would reduce transaction costs for typical energy end-users to the point of making these programs quite acceptable.

APPENDIX 3 – CRITICAL ESCO SUCCESS FACTORS

Internal Success Factors

Internally, successful ESCO development depends on three critical factors, from which a series of consequences stem:

- First factor: ability to identify in a low cost and reliable way a cost-effective EE program within the energy end-user's premises or installations; this is the energy audit issue;
- Second factor: ability to raise or arrange project-based financing from local commercial banks through a streamlined and smooth process; this is the creditworthiness issue;
- Third factor: an enabling legal framework that would recognize clearly the status and specificities of an EPC agreement; this is the regulatory aspect.

Energy Auditing Capabilities

As a fundamental principle, ESCOs have to be placed in a situation which allows them to carry out, under their sole responsibility, energy audits aiming to calculate baseline consumption and estimate the percentage of energy savings likely to be reached through a series of cost-effective investments. Because the ESCO will have to commit and provide a guarantee on this estimated level of energy savings (or to ensure that it will be able to generate enough earnings in a shared-savings approach), it is essential that it can rely on a team of trustworthy energy auditors, with a proven track record, capable of:

- Reviewing the energy consumption data of the last three/four years as well as the various parameters that might have affected it in order to establish a baseline consumption and elaborate the main elements of an adapted method for measuring and calculating the potential energy savings;
- Identifying the various technical adaptations or alterations within the energy end-user's systems or premises to be recommended in order to meaningfully reduce the energy consumption and prioritizing them to build a consistent investment proposal;
- Ensuring that the menu of investments proposed would make sense from an economic perspective (affordable payback period) even if it had to be confirmed during the following detailed feasibility study.

Such audits developed by ESCOs are called investment grade audits. Considering the sensitivity of this phase of the general approach, most ESCOs have considered that they should rely only on in-house staff, recruited on the basis of very strict competency criteria. As a matter of fact, subcontracting this task outside the enterprise may significantly raise the risk profile of projects. In addition, this technical staff can have additional supervisory functions during investment implementation.

ESCO Creditworthiness

The ESCO package includes an important financial dimension. Although an ESCO is neither a bank or a leasing or insurance company, it is necessarily exposed to a financial risk stemming from the construction of an energy performance contract. Therefore, the creditworthiness of the ESCO is a critical issue, both in the case of developing the TPF concept, which leads to bear in addition the energy end-user's credit risk and in the case of arranging the project financing through a bank to which a guarantee of results is provided. In all cases, the obvious response is an adequate equity level, meeting LFIs' standards and requirements, and this quite often constitutes the stumbling block for a number of small ESCOs, especially in IFC eligible countries. Obviously, large ESCOs, more particularly those created as subsidiaries of important technology groups such as Honeywell, Siemens and others, do not face this type of issue, while those created by smaller entities on the basis of the EE technical skills of their sponsors or staff have more difficulties developing their activities.

Regulatory Aspect

ESCOs are still seen today as a sort of "exotic" animal. It has consequences in terms of ensuring credibility and catalyzing the business, even in the private sector, where, nevertheless, the flexibility to enter into customized contracts does exist. However, a great deal of EE projects are to be found in the public sector, especially with regard to the large stock of inefficient buildings. This segment of market could be of paramount interest for ESCOs and for public sector recipients since in many countries the credit of these energy end-users is easier to bear than in the private sector and investments to be realized are usually simpler and more duplicable. However, experience has shown that EPC agreements are relatively difficult to implement in this sector, essentially because the global package proposed does not properly fit the kind of contracts which the public sector is accustomed to signing. Another reason is due to the fact that the concept is hard to integrate in the framework of the procurement rules and procedures which the public entities have to follow. Actions in that regard are not easy to define as they would have to be customized according to the national legal framework of each country.

External Success Factors

Strangely, nothing in the history of the ESCO business can demonstrate that there are mandatory external factors related to the success of the business approach. What would appear to be obvious, such as a good legal framework, a justice system that can enforce contractual agreements, adapted local financial mechanisms and so on are always good to have, but experience has shown that success and failure happen whether or not these factors are present. On the other hand, some enabling factors have shown to increase the likelihood of success in different markets:

- Enhanced awareness on the part of consumers (clients) about the concept. Without such a good understanding of the EPC concept, ESCOs are often just disseminating information about the concept and trying to sell it to potential energy end-users instead of trying to develop real business deals. Such awareness is often done by local institutional EE market stakeholders such as EE agencies, utilities, Non-Governmental Organizations (NGOs) promoting EE and so on.
- An initial market available to ESCOs, either through public sector openness to the concept or launching bids (such as in Canada and the United States) or through a supported initiative by third parties (as it would be the case in many IFC eligible countries such as China).
- The presence of an organized project financing mechanism that enables the ESCO to address the lack of interest from energy end-users in financing such EE projects.
- The absence of a legal framework that would prevent the use of the EPC model.

APPENDIX 4 – HISTORY OF THE ESCO INDUSTRY (GLOBAL)

Once it was demonstrated that EE makes money, ideas to capture this concept as a business proposition began to emerge. The first effort came from Scallop Thermal, a division of Royal Dutch Shell. Scallop took an idea, which had been used on the supply side of the meter for nearly 100 years, and gave it meaning on the demand side. Compagnie Générale de Chauffe (CGC) had for years been guaranteeing savings from its work in district heating. Scallop took this concept in the late 1970s to the UK and the U.S. offering to deliver conditioned space to its energy end-users for 90% of their current utility bills. Scallop had determined a way to effectively manage facility conditions for less than the 90% baseline and the concept of shared savings was born.

Ironically, in both the UK and the U.S., the governments opposed the concept, which was later to be known as performance contracting. In the UK, a little known accounting officer named John Majors, later to serve as Prime Minister, created government language to permit such a program. In the U.S., an embryonic energy services industry got laws passed state by state to make it happen.

The struggles, however, to establish this young industry was a long way from over. The CGC concept, as developed by Scallop, provided that each party would share a predetermined percentage split of the energy financial savings. During the life of the contract, the ESCO expected its percentage of the cost savings to cover all the costs it had incurred, plus deliver a profit. This concept worked quite well as long as the energy prices stayed the same or escalated.

But in the mid-1980s, oil prices dropped and it took longer than expected for an ESCO to recover its costs. With markedly lower energy prices, paybacks became longer than some contracts. Firms could not meet their payments to suppliers or financial backers. ESCOs closed their doors and in the process, defaulted on their commitments to their shared-savings partners. Shared savings was in trouble -- and the process became tainted by lawsuits and suppliers' efforts to recoup some of their expenses. At the same time, facility managers valiantly tried to explain losses previously guaranteed.

In spite of this tenuous start, the shared-savings industry survived but its character changed dramatically. Those who were supplying the financial backing and/or equipment recognized the risk of basing contracts on future energy prices. With uncertainty in the industry and greater uncertainty in energy pricing, risk levels grew and interest rates went up accordingly. The use of the original shared-savings agreements shrank to approximately 5% of the U.S. ESCO market.

In its place, new names, new terms, new types of agreements, and very different financing mechanisms emerged. Perhaps to respond to the negativity that had been generated around "shared savings," the industry focus turned to guaranteed energy performance. The term energy performance contracting became the favored name as a new model, "guaranteed savings" was established.

In Europe, EPC also became the popular term for the concept but the model remained heavily focused on shared savings. In the midst of the shared-savings disaster, the idea of guaranteeing the amount of energy to be saved took hold. Secondarily, the ESCOs guaranteed that the value of that energy would

be sufficient to meet the energy end-user's debt service requirements provided the price of energy did not go below a floor price specified in the contract.

From its shaky beginnings to its near death when oil prices plunged in 1986, a strong performance contracting industry emerged in North America and provided the impetus for strong growth around the world. As EPC established itself as an accepted way to provide or enable financing for EE projects, it reinforced the efforts in Europe and inspired development in Asia. The ESCO industry began moving aggressively in all corners of the world. Soon there were conferences designed to spread the word of effective best practices and to cement the existence of this new industry.

Once described as "alternative financing" by the U.S. federal government, EPC is no longer an alternative; it is an accepted way of doing business. The ESCO industry delivers EE expertise, financing and ways to meet environmental mandates. The EPC concept is now pervasive and persistent around the world. But it has not happened overnight and its development has been uneven. Many different barriers still limit the potential benefits that EPC can deliver around the world.

Starting in the U.S. in the 1990s, standardized M&V approaches for the verification of savings in EE projects were developed to assist developers (like ESCOs), owners and financiers of EE projects in quantifying energy savings on a long-term sustainable basis. In the mid-1990s, a group of volunteers compiled many of these approaches into an M&V protocol that was further refined and formalized into the International Performance Measurement and Verification Protocol (IPMVP). With generous support from the U.S. Department of Energy, the Energy Foundation, the New York State Energy Research & Development Authority (NYSERDA), the U.S. General Services Administration, Bonneville Power Administration and some funding from a few utilities in California, the volunteers formed an organization to develop and maintain the IPMVP, called IPMVP Inc. Today, the IPMVP is the leading international standard in M&V protocols for EE projects, it has been translated into 10 languages and is being used in more than 40 countries. Five thousand copies are ordered or downloaded annually. The IPMVP is owned by IMPVP Inc., a not-for-profit international organization based in the U.S. In recognition of a broader mission, in October 2004, IPMVP Inc. changed its name to Efficiency Valuation Organization and expanded its charter to address a wider range of needs in energy and water use efficiency.

For further details concerning IPMVP options, go to www.evo-world.org.

Today, the EE service sector through ESCOs continues to grow. A recent study that surveyed ESCOs offering various types of EE services in different U.S. states (California, Massachusetts, the Pacific Northwest and Connecticut) found the following trends:

- Most firms providing EE services are extremely small (often under 10 people), with a few very large firms. These employers tend to include a large number of small consulting firms and start-ups, and a few very large engineering firms and ESCOs.
- These ESCO firms' operations appear to frequently span more than one state. Most of the multi-state firms are large engineering, consulting and energy service companies. The smaller firms (e.g., home performance, HVAC technicians) generally operate locally.
- Expectations for growth are high, perhaps particularly in the EE portion of a firm's business.
- "Premium" EE jobs are likely only a fraction of the total employees in many firms. EE firms comprise a variety of job types, and in order to inform the estimates of the overall number of EE-specific jobs and the need for training programs in these specific occupations, it is important to recognize the fact that not all jobs at these firms require EE-specific skills.
- Additional EE training is needed.

In the US, total ESCO company revenues exceeded USD 4.1 billion in 2008, USD 5.6 billion in 2009 and are projected to exceed USD 7.1 billion by the end 2011. This represents an average annual growth rate of 26% between 2009 and 2011. The ESCO industry in the U.S. continues to grow despite a general downturn in the broader economy. Public and institutional markets – federal, state and local governments, K-12 schools, universities and colleges – accounted for about 84% of ESCO industry revenues in 2008 (USD 3.4 billion). ESCOs reported that EE technologies represented a major share of industry activity, accounting for 75% of ESCO industry revenues or about USD 3 billion per year in 2008. Three-quarters of ESCO projects are performance-based. ESCO projects are becoming more expensive due to increases in ESCO labor and material costs and energy end-users' demand for more comprehensive mixes of technologies.

Successful ESCO Markets

Through the long history of the development of ESCOs around the world, there have been many successful cases. It would be too long to go over each of these cases. But it has been learned that prior to achieving success in developing ESCO markets, various challenges are inescapable. One obstacle in the United States for example was its federal government having significant problems in procuring ESCO services due to its procurement and budgeting regulations that made it virtually impossible for any government agency to obtain or receive benefits from an energy performance contract. In time, these challenges were resolved. However, it is imperative to know, understand and accept that these challenges do exist within government facilities especially in the early stages of developing an ESCO industry in almost every country. Time however to resolve them is typically rather formidable.

In the following pages, we are presenting some successful ESCO market development cases. Two of these cases, one in a country where the market has been developed for a long time (Canada) and one where it has been developed more recently (Croatia), are presented below. The selection of these two cases has been made based on the diversity of the cases, based on the development stage of the countries, the size of the market, the difference in the presence of an IFI to support the start-up of the market and so on.

ESCO Business in Canada[15]

In leading the way towards reviving outsourcing of energy management services, both Canada and the U.S. pioneered the quick spread of the EPC concept more than 30 years ago. Two major obstacles were inevitable. The first was basically the lack of financing where some expected insurance of success. The second was the legal aspect wherein many lawyers were not absolutely familiar with contracts associated with EPC.

The early ESCO industry and EPC concept grew rapidly in Canada through a unique government-inspired solution to the first oil crisis in the early 1970s. Focus was directed towards identifying inefficient use of energy and promoting energy cost savings.

One of the first ESCOs in the world was initially established in the province of Quebec by electric utility Hydro-Québec. Econoler Inc. was founded in 1981 and developed the unique EPC concept based on the shared-savings approach with a “first-out” (or “fast-out”) option. This EPC concept was based on an open-book approach wherein the contract is deemed terminated upon complete payment of all project costs regardless of the contract period being completed. This type of EPC was new and very attractive for the Canadian market at that time especially when interest rates in Canada hovered around 20% for the implementation of EE projects. This approach helped overcome investment obstacles in the energy sector. From 1981 to 1989, Econoler reached a total investment of about CAD 135 million to implement more than 1,000 projects across the province of Quebec in commercial, institutional and industrial establishments, which resulted in a recurring aggregated energy cost avoidance of approximately CAD 35 million per annum.

In 1990, the Canadian government launched two major programs to further boost the ESCO concept in the country.

Federal Buildings Initiative Program

The Canadian Office of Energy Efficiency officially initiated the Federal Buildings Initiative (FBI) program in 1991 with its implementation in 1993. The FBI program is voluntary in nature and was launched for federal organizations with the main objectives of reducing energy and water consumption as well as GHG emissions in their facilities. There were three basic objectives of the FBI program that

[15] S. Hansen, P. Langlois and P. Bertoldi, “North America,” ESCOs Around the World, 2009, Chapter 7.

intended to address common barriers to EE in Canada. First was to bridge the gap in capital budget inadequacy specifically for EE projects. Second was to provide reliable information on current energy technology and practices. Third was to develop the required skills to manage retrofits. The program cost has reached about CAD 12 million since 1991. The program specifically allowed ministries and government organizations at the federal level to contract with ESCOs through a predefined procedure. The FBI program did not provide direct financing. It created a trust facilitating financing from a third party. The Government of Canada exerted efforts to overcome budget constraints in the federal sector by promoting private financing, either by an ESCO or lender institutions.

Better Buildings Partnership Program

In June 1996, a public-private partnership among Enbridge Gas Distribution Inc., the Toronto Atmospheric Fund, Toronto Hydro and Ontario Hydro Energy Inc. led to the creation of the Better Buildings Partnership (BBP) program that focused on cutting CO2 emissions in Toronto through ESCOs. The BBP program promoted its residential energy awareness program, office building and commercial building program and loan recourse fund. For the implementation of ESCO procurement, the City of Toronto, through the BBP program, offered either an interest-free on two-thirds of the loan or an energy savings guarantee equal to 50% of the investment.

Interestingly, during the same period, energy utilities launched many DSM initiatives providing grants to support the implementation of EE initiatives. These programs had a tendency to have a negative impact on the growth of the EPC market, energy end-users rather wanted to benefit from the grants and did not consider the global added value that was provided by ESCOs. Only public sector programs really stimulated the EPC market, which remains as of today essentially the main market of ESCOs.

Currently, there are 11 active ESCOs on a national basis in Canada. In addition, smaller ESCOs also operate in specific provinces of Canada. These firms are pre-qualified ESCOs through the FBI program and are listed as eligible ESCO bidders on the National Resources Canada (NRCAN) website.

The guaranteed savings model in Canada is also used across the various provinces. It represented an important part of current contracts. In the province of Quebec for example, the government has financed all the project costs in the health and education sector, requesting from ESCOs a turnkey approach and a savings guarantee. The Canadian ESCOs also adopted the shared-savings concept (in the FBI program among others) as well as the “chauffage” concept to a lesser extent.

Most Canadian ESCOs have access to pools of capital from private sector lenders or from their own organizations. These ESCOs were able to structure loans to be on- or off-balance sheet (with a lot more difficulties since the second part of the 2000s because of more restrictive international accounting rules) depending on taxation and other considerations. Other financing options were also adopted, such as municipal or capital leases.

Barriers

Despite the recognized success of the ESCO industry, some barriers remained in the Canadian market. Public and private sector organizations, which charged fees to manage buildings based on a percentage of the operational expenses, saw EE projects as a source of fee reduction. Moreover, there were some organizations in the public sector that owned an important number of facilities where they could obtain capital budgets for building renovations from the treasury council of Canada. The ESCO concept reduced the opportunity to get the renovation capital and it minimized the internal team and services that could be provided.

Additionally, notwithstanding the ESCO approach adopted in the public sector of Canada more than 30 years ago, the lack of awareness and knowledge about the ESCO and EPC concepts and how these are best used remained barriers in the private sector and much more in the industrial sector, almost not exploited so far.

Lesson Learned for IFC

Using government facilities to jump start and support the development of a private sector EE market can be a successful approach.

HEP ESCO in Croatia[16]

The creation of a utility-based ESCO in Croatia can serve as an interesting model for IFC in its quest to use ESCOs as a vehicle to implement EE projects.

This specific case was initiated through a WB project that focused on three main objectives laid out in its 1999 Country Assistance Strategy for Croatia:

1. Make the institutional changes and investments needed to ensure an efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices.
2. Achieve financial sustainability and efficient operations for public enterprises.
3. Increase the demand for EE and supply of associated services.

The project created a core developer of EE projects within Hrvatska Elektroprivreda d.d. (HEP), the state-owned power utility. A new Croatian state energy service company (HEP ESCO) was formed to develop, finance and implement EE projects utilizing local businesses as agents on a commercial (for-profit) basis.

[16] World Bank, "Loan in the Amount of EUR 4.4 million (USD 5 million) to HRVATSKA ELEKTROPRIVREDA D.D. (the National Power Utility) with the Guarantee of the Republic of Croatia and a Grant from the Global Environment Facility in the Amount of USD 7 million to the Republic of Croatia for an Energy Efficiency Project," Implementation Completion and Results Report, December 2010.

The start-up phase of the project was to provide technical assistance for the newly developed ESCO. Capacity building in project development and implementation, in project financing and support in the development of a detailed business plan was offered by an international consulting firm specialized in the start-up of ESCO operations. Electricity and heat end-users were targeted to benefit from modernization of existing facilities, decrease in maintenance budgets, and affordability of energy services. The target market included owners and occupants of buildings of various types such as housing cooperatives, commercial enterprises and public service facilities like schools and hospitals.

There was no major procurement concern during project implementation. HEP and Croatia Development Bank (HBOR) were in compliance with two covenants, specifically:

1. HBOR was to maintain a loss rate on non-performing loans of participating banks not exceeding 5% of the outstanding guarantee liability commitment (the loss rate was 0).
2. HEP ESCO was to maintain a loss rate on energy end-users' defaults supported by a partial risk guarantee not exceeding 5% of the outstanding HEP ESCO receivables (the loss rate was 0).

Initially, HEP ESCO focused on implementing EE projects in public lighting and schools as they had direct access to these clients as a utility-owned subsidiary. After some years of relative success, it started to diversify its business activities as it was the leading EE company in Croatia, active in various market segments namely public lighting, schools, hospitals, cogeneration, industry and commercial buildings. HEP ESCO was able to implement 31 EE projects for a total cumulative value of USD 29.5 million in EE investments on a commercial basis in the first five years of its operations.

Over time, HEP ESCO continued to improve its operational and financial performance demonstrating commercially and financially viable EE investments, modeling its ESCO contracting approach. In addition, HEP ESCO’s profit margin has been increasing steadily since 2006 and had reached USD 0.3 million (50% of the target) by 2008.

HEP ESCO’s good performance track record, coupled with strong marketing efforts to disseminate its project results and best practices, led to a demand growth for EE services with remarkably significant EE activities from virtually zero to seven market segments.

HEP ESCO was also able to contribute to the development of business opportunities for private firms while building capacity and transferring skills and know-how by establishing strong business relationships with other major stakeholders such as engineering firms, distributors, manufacturers and installers. This led to the development of 22 engineering/consultancy firms and academic research institutions as additional EE service providers by June 2010. HEP ESCO procured all its supplies (goods, work and installation) from domestic firms in national currency, indicating that there was a robust distribution network of EE products. In addition, over 100 small companies were involved as sub-suppliers.

An equally significant milestone in the financing industry of the ESCO development in Croatia is the credit enhancement facility that contributed to engage commercial banks in financing of EE projects. Relevant efforts by HBOR improved LFIs' understanding of EE, which led them to promote EE loans to the energy end-users. Two Partial Credit Guarantee (PCG) agreements were signed for USD 0.9 million. This leveraged investments in EE for USD 1.8 million. Three LFIs signed guarantee agreements with HBOR, thereby manifesting their interest in the new EE market while two other banks developed specific credit lines for both EE and RE investments.

An increase in the market penetration and growth of EE services and products was demonstrated by a widespread increase in Energy Conservation Measure (ECM) consciousness among targeted market segments. This can largely be ascribed to HEP ESCO and PCG activities in connection with the fact that public financing for EE projects was made available through the Fund for Environmental Protection and Energy Efficiency. Moreover, the UNDP EE project undertook important EE dissemination and awareness campaigns.

Barriers

The success of ESCO development in Croatia still left some consumers showing a lack of interest in EE and in the proposed approach of HEP ESCO. This may be attributable to the normal barriers related to the EE market (small contribution of energy costs to global operational costs, small projects, lack of time for non-core activities, etc.) and to insufficient knowledge about ESCO benefits, as well as to the lack of understanding of the concept in principle. The legislative framework is also not particularly supportive of the ESCO concept but nor is it preventing its use in any ways. Follow through legislation on EE has not been developed nor discussed at this time. The ESCO model is not yet recognized by the authorities as an individual business model. As a result, Croatian ESCOs cannot invoice their services as a package and VAT must be paid for the equipment installed for the client upfront, thereby affecting profits business-wise. Connecting CHP plants to the grid is also difficult. Similar to many other countries, public procurement remains complicated[17] when not clearly absent.

Responding to HEP and HBOR's proposals sent on June 29, 2010, the WB reached an agreement with the Government of Croatia for continued operation of HEP ESCO and the PCG facility. These relevant EE activities are indications of a good commitment level from both the Croatian government and these two lead entities towards continued pursuit of enhancing ESCO development in the country.

As of today, there is still only one operational ESCO in the country. The initial hope of developing a competitive ESCO market never materialized and should not either in a foreseeable future as HEP ESCO, with its entire key asset, is financially viable but facing important barriers at this time:

[17] S. Hansen, P. Langlois and P. Bertoldi, "Eastern Europe," ESCOs Around the World, 2009, Chapter 3, pages 84 to 85.

- The impact of the 2010 financial crisis limited the interest of many public and private sector organizations, having a direct impact on the activities of HEP ESCO.
- A political crisis related to widespread corruption erupted in 2010, leading the public sector to avoid signing sole source agreements with HEP ESCO as it had been the case since its creation.
- A new regulation by the Ministry of Finance, which prevents public sector entities from considering the financing obtained through HEP ESCO for the implementation of EE projects as non-budget operations. In such case, EE projects are now competing with any other investments in the public sector, making them less attractive.

In such a context, HEP is currently trying to develop more its market in the private sector but is facing the normal barriers to the development of EE projects in such sector as any other promoters do.

Lesson Learned for IFC

Going through a utility to support the development of an ESCO operation could be considered by IFC as such organizations have a unique knowledge of end-users and can directly access such market to promote, develop and implement EE projects.

Unsuccessful ESCO Markets

Different countries have varying approaches to developing an ESCO industry. Many factors and various market forces affect the result of EE activities. Unfortunately, not all countries immediately succeed in ESCO industry development, which takes time as adjustments are continuously made to make things happen. The subsequent cases present examples of unsuccessful ESCO markets.

ESCO Market in Tunisia[18]

Similar to Croatia, Tunisia has faced large deficits in terms of energy supply vs. energy demand since the end of the 1990s. In Northern Africa, Tunisia was actually the first country to develop an energy policy. In 1985, it created the National Agency for Energy Management otherwise known as “Agence Nationale pour la Maîtrise de l’Énergie” (ANME). The Tunisian government was well aware that the ESCO and EPC market has several barriers. It understood that without adequate and attractive incentives it would not be possible to develop the market.

Under the Tunisian Ministry of Industry and Energy (MOIE), EE programs and initiatives in Tunisia are being channeled through the ANME. In 1998, the ANME’s activities, especially in the industrial sector, were subsequently reduced as it was transferred to the Ministry of Environment and Territory. In 2001, the MOIE was re-assigned as a specific division of the Ministry’s Energy Department responsible for

[18] S. Hansen, P. Langlois and P. Bertoldi, “Africa,” ESCOs Around the World, 2009, Chapter 4.

EE measures in all sectors, including the industrial sector. The ANME was transferred back under the authority of the MOIE.

In 2000, a first private sector ESCO operation was launched in Tunisia, with the participation of an international ESCO specialized firm and four LFIs, with the support of the national energy utility (STEG). The company was internally financed for up to USD 1 million and had access to project financing from local banks. A support was offered by IFC through its Global Environment Facility (GEF) SME program development. Even though some success was obtained in its five years of operation (up to 40 projects were developed and about half were implemented), the company was never financially viable and closed its doors in 2005. The main reasons for the failure of this first ESCO operation were identified as follows:

- The market was ill-prepared for such an innovative market, not being aware of the EPC concept. The ESCO had to promote the concept for many years to have a chance to interest energy end-users in receiving a proposal.
- The concept was not adapted to market needs as the financing offered by LFIs was based on their normal practice (70% of the total project cost, full guarantee requested by energy end-users).
- The market was not convinced of the approach as it had not been demonstrated in Tunisia. Lack of demonstration projects were really a key factor in that context.
- Limited financial capacity of small ESCOs to sustain on a long-term basis the market development phase of the introduction of a new concept.

Based on the initial experience of this first ESCO and the lack of success of the ANME to change the market in the industrial sector through heavy grants, a GEF pilot program was developed in 2006 to support the introduction of the EPC concept in the industrial sector.

A partial risk guarantee fund was created and intended to address the financing barrier through the provision of guarantee-backed financing for EE projects. The risk of the loan was expected to be shared between the commercial bank and the ESCO. The concept was based on previous experience with other guarantee funds, such as the Hungarian Energy Efficiency Co-Financing Programme (HEECP), which also provided a guarantee of 50% of total bank exposure. The fund was expected to have a sustained market transformation effect by lowering the perceptions of risk on the part of commercial banks and energy end-users on EPC and energy end-user financing models.

Through the GEF project, the institutional framework for EE projects has been improved. However, lack of technical and financial tools associated with high administrative cost barriers have continuously hampered the start-up of an EE and ESCO market in the industrial sector. Even though the ANME energy audit program has supported 50% of audit costs since 1985, a large number of energy auditors have been operating and targeting the market niche but the quality of the energy audits has been more than limited.

Furthermore, the GEF program requested that ESCOs present an external insurance (through an insurance policy) to guarantee the technical risk of their project, as they did not believe that they had the internal resources to support such guarantees. As insurances were not available locally and international insurance organizations were not interested in getting involved with such a new product in such a small country, the program stalled for many years.

Even with the new financed GEF program that came on top of all the subsidies provided for the support of project development and project implementation for the industrial sector from the ANME, the market never really picked up, being mainly limited by the absence of interest on the part of potential energy end-users. Indeed, decision makers in the industrial sector still seemed more concerned with enhancing operations through improved production and productivity rather than with reducing operational costs, including through EE measures. It has also been said that the culture of the lowest cost was extremely present in the Tunisian market, and the added value concept was not well received. Negotiation is a national sport and long-term negotiations do not adapt well with the EPC concept, which needs the recognition of both parties that the agreement has to be on a win-win approach.

Barriers

To date, the ESCO market in Tunisia continues to face major obstacles. Among others, the main barriers include:

- Insufficient adapted financing instruments for EE investments. Even with the partial guarantee fund, LFIs still request important guarantees from targeted industries, generating small interest in the approach.
- EPC remains a “new” type of activity that has not gained wide acceptance in the market.
- Industrial energy end-users are more concerned with productivity/production operation enhancements rather than with reducing operational costs through EE measures. Despite the presence of ESCOs in the market and mandatory energy audits for large industries, the production priority bias in the industrial sector together with a lack of information on the benefits of EE have thus far constituted insurmountable barriers to the implementation of EE measures.
- Shortage of expertise and high-quality intermediaries who could develop projects adapted to the EPC concept. The current existing ESCOs that are originally engineering consulting firms have limited knowledge and understanding of different aspects of the EPC business including the development of the EPC concept and M&V protocols.

Lesson Learned for IFC

Trying to use ESCOs in a market where EPC is not a known concept can be very difficult and complex.

ESCO Market in India[19]

Energy is a significant factor to the economic progress of India – a relevant world economy. India's ability to optimize its available energy resources, enhanced with EE, is critical to the country's growth. The prime minister called on its government in 2002 to reduce energy consumption by 30% in the next five years. This target was noted to be achieved effectively through contracts with guaranteed levels of EE improvements engaging ESCOs. This has already been proven in several public buildings.

The ESCO model was recognized as an effective mechanism for EE. However, the 30% target was not achieved. In parallel with the programs of the Government of India, several donor agencies like the WB, USAID, CIDA, DFID and GTZ encouraged the growth of the ESCO industry in the country. From 2004 to 2007, the ESCO concept was piloted yielding an average of five to six projects per year.

Between 1992 and 1996, the ESCO industry was initially developed through feasibility studies, seminars, match-ups between Indian companies and foreign ESCOs, and project implementation all funded by USAID and several donors. The start-up of "ECO" projects facilitated the emergence of a few ESCOs focused on best practice DSM projects. The World Bank extended a USD 130 million credit line to the Indian Renewable Energy Development Agency Ltd. (IREDA) inclusive of a USD 5 million grant from GEF to fund renewable and efficiency, while also supporting ESCO market development and capacity building.

The Energy Conservation Act in 2001 established the Bureau of Energy Efficiency for regulation and promotion under the Ministry of Power.

There were 38 projects developed by 16 ESCOs in the public sector.[20] The project monitoring study revealed that they were typically all small projects, with the following conclusions:

- The ESCO concept remained relatively unknown and unexplored in India despite a decade of efforts to promote an EE market.
- The ESCOs seemed to be untrustworthy to clients and banks due to limited financial ability, inadequate experience and absence of big players.
- Since the Government of India had committed to reduce energy consumption by 30% in government buildings and establishments and that steps had been initiated to implement EE projects in selected public buildings through ESCOs, the public sector had to provide leadership and guidance to EE markets. Confidence remained to be built among stakeholders.

[19] S. Hansen, P. Langlois and P. Bertoldi, "Asia," ESCOs Around the World, 2009, Chapter 6.
[20] Econoler International, internal study for IREDA, 2007.

Despite the World Bank's "Three Country Energy Efficiency Project" focusing on getting EE financing for three clusters (paper, steel and glass) of the private sector through commercial banks, none of the funds have gone to ESCOs for project implementation on EPC. It has to be noted that the focus of the initiative was not on ESCOs and that the project led to a strategic GEF project (USD 11 million) to promote EE in SMEs.

As of today, the Bureau of Energy Efficiency considers the promotion of delivery mechanisms for EE services as one of 10 "thrust areas" in its action plan and also recognizes the strong potential of the ESCO performance contracting model in delivering energy savings. India's ESCO industry has already seen some growth over the past five years. The World Resource Institute estimated a compounded annual growth rate of 95.6% from 2003 to 2007, with ESCOs saving clients an average of 20% to 25% on baseline energy costs. However, competition in the Indian ESCO industry remains low as the high growth is shared by a small number of firms. In 2007, the six largest companies accounted for 84% of that year's total revenues (USD 17.7 million or Rs 80 crore).[21]

One characteristic of the current ESCO market in India is that many "vendor ESCOs" dominate the market. These are often equipment companies that focus on sales of a single technology, rather than a suite of energy conservation measures. Given that these companies are limited by their specific technology package, energy end-users may not yet differentiate or understand how to evaluate the different choices in EPC/ESCO transactions. The EE Indicator study in 2010 pointed to a lack of technical expertise to evaluate opportunities as the single biggest barrier facing decision makers in India. There is an additional potential problem with the vendor ESCO model when viewing India's ambitious goals to cut energy consumption. Vendors that focus on a single technology rather than a suite of energy conservation measures tend to have smaller balance sheets upon which they can finance energy end-user equipment contracts.[22]

Barriers

As in any countries, there is a need for the public sector to help jump start the market in a country as big as India. Unfortunately, the current procurement approach for ESCO services in India replicates the existing tendering process. The administrative rule is not flexible to the different nature of the EPC approach. Several ESCOs consider the current process as being complicated and costly, prompting them not to bid. As a result, this drawback leads to an unsuccessful tendering process or the selection of projects that are not the best ones for a given public entity.

In the private sector, management's lack of attention and interest in EE projects has an important impact on the capacity to develop and implement EE projects. This lack of information regarding the development of projects is a broad barrier to the development of an ESCO industry.

[21] Unlocking Energy Performance Contracting in India, Olivia Nix, Johnson Controls, 2011.
[22] Unlocking Energy Performance Contracting in India, Olivia Nix, Johnson Controls, 2011.

Another deterrent to the development of the ESCO industry in India is the conflicting process of conducting energy audits. RFPs usually include an energy audit report. Often, the owner unnecessarily pays for two audits. Both the ESCO and the owner set baseline information. The results are often conflicting. To some extent, the requested services are based on the owner's audit, thereby increasing the ESCO's risks. In addition, contract decisions are typically made at building owner level without regard to the lack of knowledge about the ESCO concept by the building's maintenance and field staff.

Contractual issues have also been prevailing difficulties met by Indian ESCOs in the past. Since accountability is set at client level, ESCOs have a hard time securing a fair, simple and fulfilling contract in India. ESCOs are perceived to make money as manufacturer, or vendor-based. Hence, potential public partners do not give due value to the benefits of energy savings. There exists a misconception that the only benefit ESCOs bring to an energy end-user is financing.

ESCOs usually utilize their own equity to finance their projects in the public sector. Indian ESCOs have difficulty obtaining credit lines from banks for the following reasons:

- Banks have poor perception of ESCO creditworthiness.
- The methodologies adopted by banks in terms of lending and appraisal are not flexible to accommodate energy savings profiles.
- ESCOs take higher investment risks forcing themselves into internal funding in order to provide performance guarantees.
- Bank loans are asset-based. ESCOs that are subsidiaries of manufacturing companies (with large assets) are rarely stand-alone ESCO businesses.
- Banks treat ESCO projects as normal commercial projects. ESCOs are asked to provide collateral for bank guarantees required by the public sector. Despite ESCOs utilizing their own internal funds taking much of the risks, banks insist upon guarantees and security deposits.

The EPC concept in India is currently mainly limited to the shared-savings approach. ESCOs are not so much familiar with the guaranteed savings model.

M&V is another major barrier to India's ESCO industry. IREDA reported the following existing problems:

- Energy end-users require from ESCOs a simplified and easy to understand M&V protocol. ESCOs are unable to develop such adequate protocols and the IPMVP is not seen by energy end-users as crucial during contract negotiations. Conflicts between parties arise in determining energy savings leading to increased uncertainty on the ESCOs' ability to guarantee performance.
- Establishing the baseline is given too much emphasis compared to M&V. ESCOs sometimes agree to adopt approximation and simpler methods instead of a more theoretically accurate M&V approach such as the internationally practiced IPMVP. There is a wrong industry perception that M&V is a considerable investment, disregarding its value as a contractual issue.

Misunderstandings due to approximations are often caused by the lack of knowledge about M&V on the part of ESCOs.

- Current M&V practices in India rely on baseline preparation with usually inadequate data. Baseline preparation takes time to consider operating conditions in the facility.
- Evaluation is not properly set up and adjustments to the initial baseline have to be justified and decided upon by the parties. However, bills may increase or remain stable after project implementation due to adjustments.
- Indian ESCOs apparently give little recognition and acceptance to the IPMVP.

Lesson Learned for IFC

In a country where an ESCO market does exist, the need for adapted financing is required to support the implementation of an increasing number of EE projects through ESCOs.

APPENDIX 5 – ESCO SUCCESS DRIVERS

Market Credibility and Relationships

The successful implementation by an ESCO of its business model in an IFC eligible country is based on a series of conditions. It would not make any sense to start developing a sophisticated model as the ESCO approach in a country where a minimum level of political stability, financial fluidity and legal enforcement of regulations can be expected, as well as a sound energy policy framework and banking context. Typical market conditions in IFC eligible countries may include high interest rates and short repayment terms of three years or less, which makes it very difficult, if not impossible, to structure the financing of EE projects so that they can be repaid from the savings generated by the EE projects. Unfortunately, these conditions are often caused by unstable currencies, inflation, regulatory and other macroeconomic events outside the banker's control. Commercial issues such as market size, market segmentation, energy prices and their potential fluctuations due to local constraints (internal taxes), available resources (especially personnel) and many other operating issues, different in each country, must be carefully analyzed and overcome through a well-conceived plan, prior to any ESCO start-up in a given country. It is important to put emphasis on EPC-related skills because most IFC eligible countries have still limited or no experience in structuring project-based financing or implementing energy savings projects on a performance contracting basis. Another key issue for an ESCO is the ability to identify a sufficient number of creditworthy energy end-users to create a large enough long-term business to justify its investment.

Often in developing countries, the ESCO needs to convince the LFIs that the energy end-user has sufficient long-term financial capabilities to stay in business throughout the repayment term of the ESCO's project investment. This is difficult to do because many energy end-users in IFC eligible countries often do not have sufficient historical financial information or substance to demonstrate a long-term financial position. The typical solution to this problem for an ESCO is to prioritize energy end-users that have international ownership because they normally are required to publish periodic financial statements in a form customary to international accounting standards. They also typically are well capitalized and have substantial market share for their particular product line. Alternatively, if the local banking industry is sufficient, it is possible to utilize an energy end-user's capability to provide guarantees to banks.

In many IFC eligible countries, industrial facilities offer the majority of EE savings opportunities for ESCOs. The ESCO model responds to the needs of these energy end-users, especially when the ESCO directly finances the EE projects, which usually give relatively low priority and are unwilling to use their internal capital or encumber credit capacity to fund EE projects versus their core business activities. The problem emanates from the relatively "low" returns of EE projects versus core business investments, coupled with a perception that they reflect energy and utility infrastructure assets which only need to be replaced when they no longer operate reliably. Even EE projects with very high 25%-50% IRRs are sometimes unable to compete with 100%+ IRRs on core business investments of some

large industrial energy end-users. The intention here is not to discuss the validity of this vision within a large majority of industrial energy end-users but just to note that this provides an excellent opportunity for ESCOs and theoretically opens a large market of EE projects to tap in. This can be done provided that (i) the ESCO managers have the skills to convince potential energy end-users that the EPC they propose does not represent any risk for industrial energy end-users; (ii) that the ESCO can run it instead because the cash flow from an EE project investment is generated from proven technologies that reduce existing utility costs; (ii) and that the project requires little or no conditions to occur outside the energy end-users' control in order for the projected cash flow to be generated.

Consequently, the ESCO market share in the industrial sector should rapidly be increasing if ESCOs demonstrate their financial capacity to raise the necessary finance (see section hereafter) and if they are able to provide a transparent and well-designed methodology that would make industrial energy end-users understand that the savings generated would be achieved and measured with minimum effort and risk.

Another segment of the market of potential interest for ESCOs is constituted of public buildings owned by various entities: directly by the State, or by local authorities such as municipalities, or other public bodies (hospitals, universities, etc.) depending on the countries and the legal status of these buildings. The EE potential may vary depending on geographic consideration but there is a consensus to estimate that this sector is more and more playing a key role with respect to both the value of savings made at the level of very constrained public budgets and the exemplary virtue given to the rest of society.

For the same reasons as those delineated in the industrial sector, (i.e., the reluctance to encumber their debt capacity to finance EE projects, even aggravated in the public sphere by the fact that sometimes, depending on the countries, public entities are just not allowed to borrow money), ESCOs have again an excellent market opportunity and a key role to play if they are in a situation to provide the necessary financing. The EPC model appears as a form of PPP. However, the preparation, establishment and implementation of an EPC agreement may be more complex than usual infrastructure PPPs. This is mainly because the private sector contractors (the ESCOs) intervening in an EPC agreement are by nature very different from those participating in infrastructure PPPs (except in the case of the construction of new buildings) and also because the expected output (energy savings) is a negative cash flow in essence difficult to capture. As a result, EPC agreements in the public building sector require an adapted management of the procurement phase and a careful design of the methodology to measure and calculate the energy savings in order to properly allocate and share the risks. This suggests that ESCOs need to develop and maintain a constructive dialogue with government officials so that specific laws or an appropriate regulatory framework and enabling environment are created in order to facilitate ESCO intervention in this area. The ability of ESCOs in developing appropriate contacts both at the political level and the administration stage will be key in that regard.

Financial Capacity

The financial capacity is fundamental to the core business model offered by an ESCO to its energy end-users, which is that energy end-users will not have to provide any capital to implement the EE projects. This is especially true in IFC eligible countries where the shared-savings financing structure is predominantly used. To a large extent, in IFC eligible countries, the financial industry is dominated by local commercial banks that finance almost exclusively on a balance sheet basis. They are generally unfamiliar with the energy savings concept and will not fully engage this sector until there is sufficient deal flow to justify the costs of developing special financial products.

As the IFC stated in one of its studies many years ago, “there is a shortage of debt financing, particularly for small- to mid-size infrastructures and EE projects, in IFC eligible countries. This shortage is attributable to a variety of factors that include transaction costs, bank regulatory restrictions and the relative newness of the private infrastructure and EE market.” However, this situation is steadily evolving and it is part of the ESCOs role to help make the necessary changes happen. Obviously, considering the factors described above, the financial capacity of an ESCO depends foremost of its level of capitalization: if only seen by the investors as a service company which traditionally can be just thinly capitalized, the ESCO has little chance to develop successfully. The challenge for the ESCO in that regard is to overcome the “disconnect” between the traditional lending practices of LFIs and the need of energy end-users and ESCOs to have EE projects financed on a “project” basis like provided to supply-side power, cogeneration and RE projects.

The traditional lending practices of LFIs for EE projects typically apply an asset-based, corporate lending approach, which has them lending directly to energy end-users (as borrowers) on a full recourse basis, with no relationship to the EE projects. The loan amount rarely exceeds 70% of total project cost and it must be supported by either a large corporate balance sheet or liquid collateral with value that minimally equals the loan amount. Unfortunately, there is limited “collateral” value in EE equipment after it is installed in existing facilities due to substantial retrofit costs to remove the existing inefficient equipment and install the new efficient equipment. The typical market value of EE projects after retrofit only equates to about 10%-20% of the total EE project cost, thereby requiring a lot of additional collateral value or financial guarantees, beyond EE project assets, to be provided to LFIs.

There is however substantial value in the cash flow generated to the energy end-users from the EE projects created by reductions in their ongoing energy and operating costs, but often LFIs are reluctant to recognize that the cash flow will be generated from EE projects on a reliable-enough basis to help repay the related loans. It is a key success driver for ESCOs to make LFIs assign a value to the cash flow generated from the EE projects without requiring energy end-users to encumber their core business credit capacity or capital budgets to fund EE projects.

The fact is that many EE projects can reduce the existing operating costs of energy end-users enough to pay for 100% of the related debt service to LFIs, and all EE projects create additional credit capacity for their respective energy end-users. It is essential for LFIs to consider this increased credit capacity

in their evaluation and financing of EE projects if they are to provide EE funding on a commercially viable and "scalable" basis.

LFIs' lack of familiarity with EE projects is likely to be overcome through a confident relationship established with ESCOs, which can provide the missing internal EE evaluation capacity. In any case, building trust and synergy between ESCOs and LFIs is essential, all the more ESCOs have no real other choice since there are limited possibilities to finance projects with international funds because of the relative small transaction size and risks associated with local currency devaluation. Local currencies of most IFC eligible countries are often subject to future devaluation, which creates a tremendous problem for financing the projects with international lenders who want to be repaid in a hard currency like U.S. dollars. The ESCOs' only reasonable solution to this is to have the energy end-users assume the devaluation risk because the ESCOs cannot typically price the cost of assuming this risk into the performance-based project. This clearly limits the number of prospective energy end-users as the most likely energy end-users who would be willing to assume this risk would be those who have significant export business or who have international ownership because they would have access to hard currencies as a normal course of their business.

APPENDIX 6 – PARTIALLY SUCCESSFUL EPC INITIATIVES IN BRAZIL

Engineering firms in Brazil started energy audits and offered specialized energy rationalization services in the early 1980s but the ESCO industry began only in 1995 wherein the first seminar on EPC concepts was held. The Brazilian ESCO association (ABESCO) was founded in 1997 with 15 members. A survey of the ESCO sector at that time estimated that BRL 16-17 million (USD 16-17 million) of projects had been implemented in 1996.

Many utilities opted to engage ESCOs to execute these EE projects. It is estimated that in 2002 about 117 projects worth BRL 23.5 million (USD 8.7 million at the time) had been contracted to ESCOs by utilities. This segment has been an important source of revenue for many ESCOs as it quickly became the biggest single market for ESCOs in Brazil. It has to be noted that most ESCOs at the time had only the name and were not using the EPC concept. Indeed, financing was done through a grant from the utilities that most of the time did not have to be reimbursed as the projects were implemented at facilities of clients that were not paying their bill (so generating “revenues” for the utilities). No performance guarantees were offered and ESCOs were only offering to implement projects under a turnkey contract.

Consumers are under the oversight of the Brazilian Electricity Regulatory Agency also known as Agência Nacional de Energia Elétrica (ANEEL), acting as the power sector regulator. Utilities were allowed to invest up to half of their EE resources in projects where they could recover their investment costs. The projects were structured as performance contracts between the utility and the energy end-user, such that provisions for payments were found in utility bills.

With a mandate on federal buildings in 2000, it was expected that the successful federal building programs of the U.S. and Canada would be replicated. These kinds of programs influenced the consolidation of the ESCO business in North America. Unfortunately, the legal issues about tendering performance contracts for government buildings were not resolved making the new program unprepared. Hence, little happened and the public building sector remained largely untapped by ESCOs.

The energy crisis in 2001 led to electricity rationing from June to the end of February 2002, which required cuts of 20% by most energy end users. The promotion of ESCO services was seen as a key element. Since the rationing was announced without warning, this energy crisis did little to develop the ESCO industry. There was not enough time to develop and negotiate EPC projects with consumers. Most energy end users opted for immediate solutions such as procuring generator sets, which briefly benefited some ESCOs.

The entry of a new federal administration in January 2003 came along with a surplus in energy supply leading to the abandonment of the promising EE initiative. While there was a glut of energy supply for several years following the rationing crisis, electricity prices for “captive” energy end-users continued

to increase substantially beyond inflation. This has improved the economics of EE projects. Another favorable factor for Brazilian ESCOs was the expansion of the natural gas distribution network. Energy end-users switching to this fuel represented an opportunity for ESCOs to identify broader EE measures, analogous to what had happened earlier with “power factor” correction. Unfortunately, very few ESCOs were prepared to exploit this opportunity, both technically and with respect to their capacity to offer adapted financing to interested energy end-users.

In 2006, in the context of the World Bank support to Brazil under the three-country ESCO project, the National Bank for Economic and Social Development (BNDES), otherwise known as Banco Nacional de Desenvolvimento Economico e Social, approved an innovative new credit line in 2006 that was called PROESCO and which was designed to address a long-standing problem of guarantees for loans to EE projects. The BNDES is the ultimate source for almost all medium-term commercial bank debt financing in Brazil. For many different reasons, the program was never made really operational and was cancelled in 2010.

The majority of the 75 listed ESCOs are only suppliers or engineering consultants that sell energy-related services and equipment as part of other core offerings and without any performance-related payment aspects. A much smaller group of approximately eight companies are really ESCOs focused on the development and delivery of EE projects as their core business, from which three are utility subsidiaries and the balance are engineering companies. Many ESCOs offer financing only through the use of their own equity and do not leverage any of it through loans from banks, which do not seem to have any appetite for such market (even though extensive efforts have been done to convince them to enter the EE market through the World Bank three-country ESCO program).

In 2009, the estimated deal flow was not easy to estimate due to a distortion in the market related to the DSM funding provided by electric utilities to energy end-users. However, a rough estimate of the level of performance contracts (discounting DSM utility-funded projects) provided by the core eight companies was estimated to be an average of BRL 2 million per company or approximately USD 16 million per year.

While a sizeable potential exists for not only energy savings but also industrial cogeneration, ESCOs (and other service providers) have not been successful in penetrating these opportunities due to their relatively small size and perceived risks by energy end-users associated with EE technologies. Other barriers include the poor business climate, no tax incentives, unenforceable elements of the legal system and most of all a lack of viable financing. The banking sector does not view EE as attractive due to its small transaction size, as is the case in many countries.

For years, the utilities have collected from rate payers enough funds to invest a required 1% of their annual revenues in EE projects. However, the bulk of the funds have been used by the utilities to improve their own systems and very little has reached end-use sectors.

Barriers

The ESCO sector has matured more than the increase in volume of business alone would suggest. However, many of the historic barriers continue to limit the growth of the ESCO business.

ESCOs almost always use their own capital when financing for EE projects. Loans to ESCOs for EE project financing have been very rare. Lack of access to TPF as in other countries has historically been a key barrier to the expansion of the EE market. Although the ESCO industry and EPC have expanded substantially over the years, the volume of business is still well below the EE market potential. The identified barriers are quite common but there are others specific to Brazil. All of the following inhibiting factors are present in the Brazilian market.

Lack of EE Project Financing

The lack of access to financing is a major barrier consistent to other countries where EE financing is viewed as a single major bottleneck for ESCO industry growth. Commercial banks' interest rates (18%) for loans have been among the highest in the world. Even though at this high rate working with loans instead of equity would be of interest, lack of understanding about financing is more the norm rather than the exception in the ESCO community. Another important barrier has been the guarantees required for commercial bank medium-term loans intermediating from the BNDES. Loans originating in the BNDES are the cheapest and often the only feasible source of medium-term debt capital available to most ESCOs. However, requirements for real collateral are very high. There is zero value given to an EE project's future receivables. The processing period for loan approvals has also been very long. All this makes things impossible for most ESCOs to take out any loan at all.

Lack of Awareness and Wrong Perceptions of Potential Energy End-Users

Energy end-users' poor understanding of the added value of what ESCOs provide with their energy savings guarantees represents an impediment.

Difficulties in the Decision-Making and/or Procurement Process of Potential Energy End-Users

The "complexity of the potential energy end-user decision-making process" was considered to be a significant problem. Although EPC has been non-existent in the global market, there have been substantial EE investments in the public sector under the utilities' EE programs regulated by ANEEL. These have been undertaken almost entirely on a 100% grant basis. This approach severely limits the volume of possible EE projects. Beyond demonstrating economic viability, these projects have done little so far to help transform the market for EPC in the public sector.

Distortions in Energy Prices Affecting the Economic Viability of Projects

There is a huge difference in the cost of peak versus off-peak electricity tariffs. Some consumers typically pay six to nine times more over peak periods. The consequence of this distortion is an increase in investments simply to reduce contracted peak demand.

Credibility of ESCOs and the EPC Mechanisms

The credibility of the EPC mechanism is more of a restraint than the credibility of ESCOs. In mid-2007, GEF approved a project seeking to accelerate EE building retrofits in Brazil. Prior to launching the project called “Market Transformation for EE in Buildings,” targets were already perceived to be ambitious. Another factor is the lack of understanding of M&V, necessary to the implementation of EPC. Only in May 2011 has there been a first IPMVP training and certification event to help ESCOs and other stakeholders understand the good practices of M&V. Still, that was not disseminated widely and very little is known about it in the market. Lack of understanding and acceptance of M&V poses as a barrier to EPC.

APPENDIX 7 – PARTIALLY SUCCESSFUL EPC INITIATIVES IN CHINA

The World Bank approved USD151 million for a China Energy Conservation Project ("**CEEP**") in March, 1998, with the largest components being: USD 15 million from the GEF, USD 63 million from IBRD, and USD 54 million from domestic sources. The CEEP funding was used to support the establishment of three new pilot Chiness ESCOs and Energy Management Company Association (EMCA), the Chinese trade association for ESCOs. The USD 15 million GEF grants and IBRD loans of USD 63 million were distributed equally to the three new pilot Chinese ESCOs. The CEEP goal was to introduce, demonstrate and disseminate the advanced market-oriented energy conservation mechanism referred to as "Contract Energy Management" (same as EPC) and strengthen the effective dissemination of energy conservation information in China.

The Chinese ESCO industry was created in 1998 as a result of the above-described World Bank's creation/funding of three government-owned ESCOs. While there about 20 very large ESCOs today, most Chinese ESCOs are small, single technology manufacturers or service providers with access to a large number of potential EE projects that they cannot implement due to limited financial capacity, limited industrial EE technical experience (beyond their single technology) and virtually no funding for their EPC projects. According to EMCA's "2010 China ESCO Industry Summit Meeting Proceedings" provided in January 2011, over USD 2.4 billion of energy performance contracting investments were made in China in 2010. Despite this very large investment, there still remains a significant backlog of EE projects for Chinese ESCOs. This technology capability coupled with limited energy engineering and deal structuring skills have created a significant technical gap for most ESCOs in China. Filling this technical gap will result in an increased scope of technologies implemented in EE projects, more savings and a larger investment by the fund. There are a few very large local ESCOs owned by large companies that manufacture EE products and which have used the ESCO model to pull their products through the marketplace.

Chinese ESCOs' inability to finance their EE projects is compounded by the fact that the shared-savings model is predominantly being used in the market. As previously described, the shared-savings model requires ESCOs to fund (upfront) all of the capital for their EE projects and then wait to get repaid from savings over long periods of time (75+ years). Since virtually all Chinese ESCOs are SMEs with limited corporate (or personal) financial capacity, the high level of equity required coupled with the heavy collateral requirements for debt have severely limited the volume of EE projects they can implement, which has created a significant backlog of EE projects for them.

A diversity of complex EPC contracts can be createed based on the practical situation of each project in China. The EPC mechanism has been promoted widely. The ESCO industry is continuously developing with enhanced ESCO capacity and more financing channels. Unfortunately, the World Bank ESCO development program only provided government-backed project funding exclusively to the three government-owned ESCOs and did not provide any sustainable project financing program

for the rest of China's ESCO industry when their program ended in 2007,. Consequently, after funding was utilized by the World Bank's three ESCOs over five years ago, they, along with the Chinese ESCO industry, struggled to grow because of their inability to access any meaningful financing for their EE projects on a paid-from-saving basis.

The World Bank recognized this as a tremendous barrier and attempted to overcome it with a loan guarantee program established in 2002, which it hoped would be leveraged to USD 250 million of lending from commercial banks for ESCO projects. Through this guarantee program, they established a USD 22 million reservie account for the China National Investment and Guarantee Company ("**I&G**"), which issued loan guarantees for 148 ESCO projects during 2004-2009. Guarantees totaled RMB 517 million (USD 69 million) supporting RMB 918 million (USD 123 million) in energy performance contracted project investments. Although never publicly stated, the authors of this report have concluded that the guarantee program was generally regarded by most Chinese ESCOs as a failure because it required them to provide to I&G personal or other assets as security at a equal value to as 100% of the EE loans. This allegedly included some owners and management of the ESCOs providing their personal residences as collateral. We believe the perceived failure is supported by the fact that default losses were essentially non-existent, with the initial $22 million in the reserve account having remained in place at the end of the World Bank project. There were no losses because essentially no risks were assumed by I&G. Many ESCOs told the authors they only accessed the I&G guarantee once and did so only to gain credibility in the market place. They quickly paid it off since they saw no sustainable value in paying a guarantee fee to provide similar levels of collateral to what the local banks required.

The IFC CHUEE partial credit risk program has had lots of success in getting its local partner banks to finance energy efficiency. However, its design delegates virtually all of the credit analysis and loan structuring to the local banks, which has resulted in most loans being made on a 'business as usual' basis; meaning lending to large SOEs on a full recourse basis with no relationship to or recognition of the future savings or cash flow from the EE projects. This approach has significantly limited the number of ESCOs and SMEs that develop or implement EE projects from obtaining loans since they are only able to offer the future EE project savings as collateral. However, there is a great opportunity to slightly modify IFC's current partial credit risk program to have a significant impact on EE financing by the local banks, which we have proposed in section 2.1.1. of its recommended EE finance mechanisms.

The investment opportunity in the China EE market is enormous with estimates in excess of USD 100 billion. The local ESCOs are well positioned to be the leading service providers of that market if the financing and technical gaps for the Chinese ESCO industry can be filled.

After several years of development, ESCOs in China have been developing the EPC models in several ways based on the shared-savings concept. Different types of EPC projects have already been implemented. At present, mainly there are three types of EPC contracts in China. One is the shared-savings contract where the ESCO provides investment and services while the enterprise

provides promissory advance charge for the ESCO operating or conducting renovation on the excising energy system. The ESCO reduces energy expenses (deducting new added management fee) through improving EE and retains all or part of the energy costs saved, in accordance with the contract. The EPC agreements in China do not fit the shared-savings models defined earlier as commonly used in North America and other countries. Client payments under the Chinese shared-savings scheme are stipulated in the contract and the ESCO does not incur a performance risk. A diversity of complex contracts can be formed according to the practical situation of each project. The EPC mechanism has been promoted widely. The ESCO industry is continuously developing with enhanced ESCO capacity and more financing channels. The Chinese ESCO industry has become an important player in the energy conservation endeavor in the country. By the end of 2010, EMCA registered membership reached nearly 600 from 59 in 2004. The investment of EPC projects reached more than USD 2 billion.

Barriers

For ESCOs that provide EPC services, the capacity to implement a simple project is needed. More importantly, capacities with respect to energy audits, project design and construction management are crucial. Once a project is implemented, the ESCO oversees the operations and manages the project inclusive of M&V. This is a basic requirement for ESCOs to minimize the risk and improve financial capacity. ESCOs are facing more complicated and complex conditions.

However, most ESCOs have little or no ability to finance their larger EE projects, which has resulted in a significant backlog of EE projects to be funded. This funding gap has been caused by the dominant shared-savings business model offered to energy end-users whereby the ESCOs fund all required upfront capital for the turnkey installation of EE projects and receive their long-term repayment (5+ years) from energy end-users as savings are achieved from the EE projects. As in many similar countries, the primary sources for Chinese ESCOs to finance their large EE projects are: 1) 100% equity from third-party investors; and/or 2) long-term debt from local lenders who require at least 30% equity and liquid collateral equal to or exceeding the loan amount. As a result, there is a significant backlog of EE projects for most Chinese ESCOs.

Specifically, the main barriers to ESCO development in China include:

- The relatively small-scale services provided by the ESCO industry hardly meet the demand for energy services. Staying “small but integrated,” these ESCOs lack the capacity in technology innovation. Most ESCOs are SMEs.
- The limited capacity of ESCOs. Most of the ESCOs lack financing approaches and technical skills.
- The lack of competent human resources does not meet the demand for the development of the ESCO industry.

In order to fully capture the above EE opportunity, another ESCO industry gap needs to be filled which is the technical gap caused by limited energy engineering, deal structuring and project financing skills. Filling this gap will increase the scope of technologies implemented in EE projects and result in more savings and a larger investment.

APPENDIX 8 – PARTIALLY SUCCESSFUL EPC INITIATIVES IN CÔTE D'IVOIRE

From 1980 to 1990, EE project development was introduced involving national electricity companies in West Africa, particularly in Côte d'Ivoire and Senegal. UNDP implemented a regional EE pilot project in 1993. The project enabled Côte d'Ivoire to determine the EE potential for both public and private buildings. UNDP completed energy audits of the major buildings in the country and technical knowledge was developed, paving the way for the introduction of the ESCO concept. However, no relevant EE investment was made to support the development of the EE market and the ESCO industry, despite the great potential for energy savings in the country and in the region.

Côte d'Ivoire is an emerging economy, growing at a fast pace in Sub-Saharan Africa. Hydropower can no longer provide the country with the energy resources needed to meet the demand. The Government of Côte d'Ivoire's new energy policy plan focused on fossil fuel reduction while EE initiatives were not previously emphasized in most industrial and commercial sectors in the country.

A few consumers also set up successful EE measures. A hotel in Abidjan used heat generated by its air conditioning systems to produce hot water. Capacitors have been installed at many factories. By developing a balance between energy demand and supply including financing aspects, the EE market was based on a more holistic approach. However, the EE industry still lacks the involvement of LFIs to optimize the potential of the EE market.

Resources have been provided for ESCOs' initial needs including USD 10,000 in seed capital for equipment, living allowances and initial overheads for each ESCO through loans (interest-free) reimbursed as a fixed portion of their future revenues. A USD 200,000 RF, administered by Crédit Mutuel de Côte d'Ivoire, was set up by the IEPF with an interest rate of 8% applied to the first year reaching 16% in the third year. Emphasis was put on mobilizing LFIs to provide additional financial resources promoting EE businesses in Côte d'Ivoire. The commercial banking industry and other LFIs were provided with information on ESCO approach and EE market with special attention on supporting ESCOs through private funding and mitigating financial risks. Part of the resources served as guarantee fund to loans extended by a private LFI to a client under a contract with an ESCO.

Various types of contracts were offered by the ESCO industry taking into account the local legal context. In an Ivorian guaranteed savings contract, the ESCO is remunerated for the whole of its services as it guarantees certain amounts of annual energy savings to the energy end-user. Under this contract, the ESCO usually includes design, installation and savings performance risks, but does not assume the credit risk of repayment by the energy end-user. In a shared-savings contract, the ESCO is remunerated based on a percentage of energy cost savings varying between 10% and 90% over a certain contract period. The investments are generally carried out by the ESCO, which bears performance and credit risks.

ESCOs in Côte d'Ivoire offer a turnkey package of EE services including energy audits, feasibility studies, brokering of financing, specialized documentation for performance contracting, project engineering and implementation, including M&V services.

Barriers

The IEPF and the World Bank's pilot program to develop the ESCO market in Côte d'Ivoire in June 2000 aimed to overcome the obstacles to EE investment in the region. The EE objective of the Côte d'Ivoire ESCO project was to establish a sustainable commercial market for EE services between suppliers and energy end-users, obtain energy savings and reduce associated GHG emissions. The program successfully engaged four companies in developing the ESCO industry in Côte d'Ivoire: two large companies with an existing client portfolio to which they provided maintenance support and two individual companies dedicated to offering EE services.

APPENDIX 9 – PARTIALLY SUCCESSFUL EPC INITIATIVES IN HUNGARY

French ESCOs pioneered the early development of the industry in Hungary coupled with strong local engineering expertise and interest in entering a new market for energy services. The ESCO market size is approximately EUR 150-200 million, excluding large power plant investment opportunities.

Due to the long-term security that ESCOs and specific support programs of the UNDP/GEF Hungary, Public Sector EE Project and the Szemünk Fénye (Light of Our Eyes) seek, most EE projects were found in the municipal sector. Poland and Hungary: Assistance for Restructuring their Economies (PHARE) co-financed twinning projects with the German Carbon-Aid Fund targeted the EE market, increasing the willingness to employ ESCOs. The involvement of ESCOs in the residential sector was coursed through the combination with targeted state subsidies and/or subsidized loans.

Apparently, the ESCO market has reached a saturation level after almost two decades. During the 1990s, a typical project's payback period ranged from three to five years. Currently, EE project payback periods span from five to seven years eliciting major challenges to the Hungarian ESCO industry.

Moreover, international aid is decreasing or coming to an end as in the case of UNDP/GEF's Hungary Public Sector EE Project. The ESCO industry is going through a transformation process with some companies exiting or changing their core businesses away from energy service provisions after experiencing market stagnation. ESCO project distribution indicates 30% to industry, 30% to district heating retrofits and 30% to the municipal sector. RE investments have also recently begun.

Barriers

The lack of credible baseline data remains a technical barrier in EE projects resulting in prolonged and more expensive EE project development. Energy end-users sometimes pay averaged monthly fees (not the actual energy consumption) in the absence of detailed billing systems. ESCOs are prompted to spend one to two years establishing the baseline information prior to project implementation in order to prove the savings. Internationally practiced M&V protocols have not been widely introduced. Remuneration of an ESCO for EE projects is usually hinged on trust established between the ESCO and the energy end-user.

Forms of financing are barriers found in the public sector. Municipal borrowing is limited with a cap. Local authorities cannot differentiate traditional loans from the EPC approach. There is a lack of information about opportunities with ESCOs and EPC. Procurement difficulties biased to cost-related items only, coupled with fear of redundancy accusations also limit municipalities' willingness to engage in ESCO projects. Furthermore, municipal authorities are often suspicious of the financial schemes and feel uneasy about sharing an EE project's financial benefits with a private company. As a result, proposed EE projects are either postponed or not implemented at all.

ESCOs have difficulty planning and concluding ESCO contracts that are longer than three to four years. ESCOs accord their proposed EE project tenure on the four-year election cycle. EE project development alone takes time. This approach limits the scale of potential EE projects.

In the residential sector, split incentives with investment and operational expenses coming from different budget lines have always been a major obstacle. The law requires the consensus of all apartment owners (decision makers) and entering into a long-term contract is very hard in the case of hot water, heating or insulation renovations of a large block house for instance. Furthermore, ownership of certain facilities (e.g., water tubes, walls) is neither clear nor stipulated in the housing association contract, thereby causing a stalemate in EE project development.

Some of the above barriers are also found in the industrial sector. The lack of reliable benchmarks and the complex structure of the plants' systems result in difficulty defining the scope of the projects.

APPENDIX 10 – FAILURE CASE OF EPC INITIATIVES IN EGYPT

The result of the awareness and capacity building activities was limited to the development of the Egyptian Energy Service Business Association (EESBA), an NGO representing the ESCO industry to help expand EE market opportunities and promote the interests of companies working in the Egyptian energy sector.

The EESBA actively participates in policy-making, links key business groups with government leaders, encourages EE partnership initiatives and helps develop capacity building for the EE market. In cooperation with the Association of Energy Engineers (AEE), approximately 300 engineers have been certified as Certified Energy Managers (CEMs).

About half of the identified 19 large ESCOs can provide EE application services, 25% are capable of limited EE services and the rest could provide individualized services such as consultation only or single technology advisory only. Despite the huge number of CEMs, M&V know-how and experience is inadequate resulting in contracting capabilities limitedly hinged on specific product guarantee provisions. The UNDP-sponsored EE project in 1999 delivered a simplified version of the international M&V protocol. Since its inception, the UNDP project provided significant support to the struggling ESCO industry including partial incentives for conducting energy audits, support to credit guarantee mechanisms supporting project financing and support in evaluating project and product performance.

Very few SMEs have experience with the full range of EE products and services conveniently leading them to be outsourced subcontractors of specific products or services only for larger ESCOs. Egyptian and other multinational service providers are simply comfortable supplying EE products with limited skills estimating technical performance. To date, the inability of the Egyptian ESCO industry to implement EPC agreements under current market conditions remains a formidable challenge.

Barriers

Mainly due to LFI's (banks and leasing companies) keen interest in low-risk clients with good potential for profit, financing of EE projects remains one of the key challenges facing the Egyptian ESCO industry. Banks are also reluctant to invest in EE projects for SMEs. LFIs are less enthusiastic in considering installed EE products as collateral. LFIs do not see reductions in operational costs through energy savings as the additional generated revenue that they seek for investments.

The current key barriers to the development of the Egyptian ESCO industry include:

- Energy prices are subsidized thereby reducing the incentives to implement EE projects (subsidies will be phased out soon).
- There is a lack of compelling incentives to adopt EE technologies, especially in the public sector (the most promising segment).
- Government procurement regulations are biased to product costs whereby energy savings through integrated energy services under EPC approaches are not yet accepted as normal practice.
- Lack of LFIs interested in financing EE undertakings.
- Limited perception of the true value of ESCO projects. Energy end-users and project owners typically decide on projects based on a first-cost basis and not on a life-cycle cost basis.

APPENDIX 11 – FAILURE CASE OF EPC INITIATIVES IN THE PHILIPPINES

The attention to EE in the Philippines has been swinging directions over time commencing in the early 1970s when the country felt the impact of the first oil crisis in the world. One of the identified key strategies to increase the participation of the private sector in EE was to revitalize the ESCO industry. The establishment of the ESCO industry in the Philippines emanated with the introduction of DSM programs in the 1990s. The definition of an ESCO was very limited then as a company that offered electromechanical design for increasing the efficiency of facilities and utilities. ESCOs were noted to provide energy audits, install energy conservation devices or monitor and control electrical systems and mechanical sewerage. At present, only a few ESCOs in the Philippines are doing general energy audits.

To better promote ESCOs, an association was established in May 2005 called ESCOPhil. It was meant to organize the firms engaged in the energy service industry, whose main purposes were to:

- Provide a forum for the effective exchange of information about industry trends and practices, and for the introduction and propagation of new technologies for the industry;
- Promote EE and energy demand reducing technologies, thereby creating economic values;
- Develop strategic advocacy positions with various government agencies;
- Initiate policies geared towards increasing business opportunities for members; and
- Educate and accredit other firms and organizations to become members.

ESCOs in the Philippines generally develop EE projects for a wide range of tasks and responsibilities. They assume the technical and performance risk associated with the EE project. Normally, they offer to develop, design and finance EE projects. They install and maintain the EE equipment supplied. They measure, monitor and verify the project's energy savings. They assume the risk that the project will save the amount of projected energy savings by providing guarantees in the contracts. ESCOs pay the energy end-user for any guaranteed savings shortfall.

Contracting with Philippine ESCOs come in various ways depending on the degree of risk that the ESCO will assume. The cost for ESCO services are normally higher if the ESCO assumes all the technical and financial risks guaranteeing EE project performance. There are three common types of ESCO contracts adopted in the Philippines: the shared-savings, guaranteed savings and fee-for-service contracts.

Under a shared-savings contract, the energy end-user commits to pay a regular professional fee equivalent to a percentage of the realized cost savings to the ESCO. The fee represents the cost of services rendered including the design, implementation and monitoring of the EE project. The energy end-user assumes no credit risks and pays the ESCO a share of the savings that the project achieves as its sole obligation. The ESCO, which finances the project, assumes both the performance and

credit risks. Since shared savings is vulnerable to energy price volatility, this approach is more suitable for projects with short payback periods.

Under a guaranteed savings contract, the ESCO guarantees a given value of energy savings. The energy end-user makes periodic debt service payments to an LFI for the loan used to pay the ESCO for developing, designing and installing the EE measures. If the guaranteed savings level is not achieved, the ESCO pays the energy end-user equivalent to the shortfall between the guaranteed energy savings and the realized energy savings. However, the energy end-user keeps any savings in excess of the guaranteed savings level unless stated otherwise.

In 2004, the Asian Development Bank conducted a survey to determine the past and current activities of ESCOs. The survey also focused on the identification of the critical success and risk factors of ESCOs, as well as the problems and opportunities for both EE improvements and development of the ESCO industry. The critical success factor was determined by the survey to be the financial capability of ESCOs. The cash flow was determined to be the most important risk factor.

Under the UNDP/DOE PELMAT project, a model ESCO transaction project was prepared with the Development Bank of the Philippines (DBP) and BDO as cooperating facilities. The project targeted an LFI with the objective of letting the LFI experience an EPC transaction. DBP is a state-owned national development bank while BDO is a private financial institution. DBP was originally tapped for the model ESCO project wherein EPC was designed to be undertaken by an ESCO. This first intended model ESCO transaction was not successful due to major impediments such as the following.

In approving an ESCO to avail for a loan, DBP's standard was high and unrealistic. It required the lowest bidding ESCO to have a track record that matched or surpassed the required capitalization for the intended EPC project on DBP facilities. There were relatively few ESCOs available in the Philippines that could qualify. The number of EPC transactions through ESCOs has thus been limitedly few.

DBP, being a government institution, remains under the regular evaluation of the Philippine's Commission On Audit (COA). The COA does not have provisions for book keeping vis-à-vis the concept of EPC specifically off-balance sheets. The COA is bound to implement standard procedures wherein budget allocations are considered valid specifically for a year only.

An ESCO transaction may necessitate a term of more than a year (five to ten years in some actual ESCO transactions with private companies). The variable payment transactions, based on actual and unpredictable specific monthly energy savings, made the ESCO services complicated to fit in the standard accounting procedures of the COA.

Stringent requirements of R.A. 9184 otherwise known as the Government Procurement Law complicated the whole process. Among the major ESCO concerns included the classification of the procurement under R.A. 9184 (i.e., whether it should be classified as procurement of "goods," "works" or "services"). The project sought for approval for the use of "Consulting Services" as part of eligibility

criteria. The Government Procurement and Policy Board disapproved the use of the "Procurement of Consulting Services" in the eligibility criteria in place of "Procurement of Works."

The inherent civil works that will eventually be involved in the project implementation complicated the use of the term "Consultancy Services." The Government Procurement and Policy Board stated that the ESCO-related project could qualify under a Build-Operate-Transfer scheme of procurement.

Due to the complexities of the nature of ESCO services and energy performance contracting transactions vis-à-vis the government procurement law, government budget appropriations, government accounting procedures and the like, the project was eventually directed to a re-bidding under a standard/normal procurement process. It was decided that the project would be treated as an ordinary lighting retrofit project of the Bank.

Considering the above failure, the UNDP/DOE PELMAT project attempted to re-direct the model ESCO transaction to BDO. BDO is more flexible in terms of bookkeeping and other related policies, being private in nature. Unfortunately, BDO was at the verge of acquiring PCI Equitable Bank. During the acquisition, change of management and corporate directions halted the planned pilot project for one of BDO's branches. This resulted in another unsuccessful attempt to implement a model ESCO transaction.

The UNDP-GEF-DOE PELMAT project has identified the following four major barriers:

1. Technical Barriers:
   - Absence of ESCO accreditation for energy audit services and/or EPC; and
   - Few ESCOs provide general energy audit services.
2. Financial Barriers:
   - Absence of financing programs to industry and/or ESCOs; and
   - No available government incentives.
3. Institutional Barriers:
   - Weak EPC concept propagation to industry and financing institutions;
   - "Credibility" issue due to previous industry experience;
   - Young ESCO organizations; and
   - No energy management or energy conservation center.
4. Regulatory Barriers:
   - No applicable energy conservation law; and
   - No prevailing ESCO ownership structure for local investors/players.

Some of these EPC transactions are considered failure either because: 1) the target energy savings are not met; or 2) the clients contest the validity of energy savings claimed by ESCOs only after retrofits have been completed. The main reasons for such failures are attributable to the immature ESCO market in the country. Just to get a project reference, some of the local ESCOs try to win EPC projects at the mercy of the clients' demands, raising unnecessary risks and compromising the feasibility of projects.

APPENDIX 12 – FAILURE CASE OF EPC INITIATIVES IN UKRAINE

Potential EE investments in Ukraine as in many other countries are mainly affected by its economic condition. Firstly, the Ukrainian economy has continued to decline during its first few years since the country got its independence in 1991. Primarily, Ukraine is one of the most energy-intensive and inefficient economies in its region. Thus, Ukraine's economy is facing important structural and economic challenges in the years ahead.[23] Common to the state sector, energy arrears have been foremost a challenge to an ESCO market. In contrast to its neighboring countries such as Russia, privatization has been limited. Commercial tariffs differ depending on the type of energy end-user. Residential electricity rates for example are lower than the industrial sector's tariff, making EE projects difficult to develop.

ESCOs in Ukraine are established benefitting largely from financial assistance provided by the World Bank, GEF, IFC and USAID[24], among others. International lending agencies, such as the International Monetary Fund, have critiqued the country for its deficiency in instituting sufficient reforms.[25]

The ESCO industry in Ukraine remains quite unaccustomed to international ESCO best practices. UkrESCO is the main ESCO in Ukraine with considerable financing capability explicitly for EE opportunities. Through UkrESCO's financial and corporate structure, a full package of services including financing and project implementation can be provided. One of the most unique and emerging contracting models found in Ukraine is the public ESPC[26] or Energy Savings Performance Contract generally known as EPC. Through the EBRD, quite a few ESCOs around Ukraine have been created. There are numerous engineering and consulting companies in Ukraine that provide EE services also. Many of these organizations are relatively small and/or associated with Ukrainian technical institutes.

UkrESCO is a state-owned joint stock ESCO with financing access to approximately EUR 36 million in loan and grant from the EBRD. The Ministry of Finance is chiefly responsible for the sovereign guarantee that secures the EUR 30 million EBRD loan while the State Committee on Energy Conservation is the nominal owner of UkrESCO. The EU's technical assistance program, TACIS, provided EUR 3 million in funding for the project management unit, run by Econoler and Nexand (previously known as Bechtel Consulting Ltd.) with an additional EUR 3 million as grant to subsidize 10% of EE project costs. The Pacific Northwest National Laboratory and its partners, the Ukrainian

[23] EBRD, "Executive Summary," Strategy for Ukraine, September 2007.
[24] J. Ellis, IISD, "Other Countries," Energy Service Companies in Developing Countries: Potential and practice, page 12, March 2009.
[25] M. Evans, Ibid.
[26] J. Singh, ESMAP Briefing, "Emerging ESP Contracting Models," Public Procurement of Energy Efficiency Services, September 2010.

Energy Efficiency Center and Industrial Real Estate, collaborated with UkrESCO in preparing projects for financing. Another USD 20 million loan from the EBRD was provided for the 2006 to 2012 period.[27]

It is not typical for the EBRD to finance public sector companies but it did so in this case of UkrESCO in order to encourage the ESCO market since no other Ukrainian entities had been cooperative to undertake equity investments in the ESCO business in the country. In April 2000, UkrESCO signed its first EPC with Gostomel Glass Plant. Few other foreign EE companies have also considered operating as ESCOs in Ukraine, including those which had initially been invited to Ukraine under several TA programs such as the Alliance to Save Energy which has worked with the U.S. ESCO Facilities Management Control Systems in Lviv on a consulting basis. Another example is PCG-ESCO (a U.S.-Ukrainian consulting firm).

USAID was largely responsible in establishing several regional ESCOs around Ukraine, including ESCO-East, ESCO-Center and ESCO-West. ESCO-East received financing assistance for its EE projects through a grant from USAID. Unfortunately, the company ran into financial complications. External financing through commercial bank is available but only at extremely high interest rates and for tenors under a year. The typical payback period for EE projects in Ukraine ranges from two to five years.[28] EPC therefore becomes unattractive and rarely economically viable. As a result, regional ESCOs implemented EE projects merely by providing advice with traditional payments for services and not hinged on the EPC model.

The industrial sector is the major source (70%) of ESCO projects in Ukraine primarily because industrial plants can provide collateral and guarantees. Additionally, private industrial plants have lower energy arrears compared to most state-owned organizations. Publicly financed projects such as the World Bank's Kyiv Public Buildings Energy Efficiency project also provided opportunities for ESCOs but not necessarily through EPC.

In June 1999, the President of Ukraine issued a decree "On Measures for Reducing Energy Consumption by Budgetary Institutions, Organizations and State Enterprises." The Ukrainian government has expressed interest in promoting private EPC as a means to raising EE awareness in state-owned facilities, theoretically providing a legal basis for using EPC in the state sector. However, many details of how the decree will be practiced to promote ESCOs (including tender rules) have not yet been threshed out. The corresponding absence of established accounting regulations and tax rules that should accommodate EPC poses as one of the major obstacles in creating an ESCO industry in Ukraine. Ukrainian legislation does not clearly allow EPC. Many potential ESCO energy end-users are afraid of being taxed disproportionately for ESCO services or their EPC arrangements will be terminated.

[27] W. de Wilt, “Other European Countries,” Developments of Energy Service Companies across Europe: A European ESCO overview, 2007.
[28] Ibid.

One of the most important lessons learned in the ESCO industry in Ukraine through PPPs, is that an ESCO market is proven to be difficult.[29] As ESCOs can be modes of relevant roles in EE projects (marketers, project developers, operators, guarantors of EE performance and financing facilitators), the government needs to take further actions to promote ESCOs and EPC models, which remain relatively new in Ukraine.[30]

Barriers

Information barriers can be systematically addressed by ESCOs and associations of ESCOs that can raise awareness and the needed information. There have been a few ESCOs that joined Ukraine's national Association of ESCOs through USAID's assistance.[31] There are currently about three active ESCOs in Ukraine with a few dozen local ESCO-like engineering consulting firms.[32] However, demonstration projects still need to be considered as an effective means of information to spread, understand and trust ESCOs and EPC.

Numerous ESCOs are interested in EPC but they can hardly find financing sources. ESCOs in Ukraine have very limited access to capital, both internally and externally. LFIs impose very high interest rates and they are not readily involved in EE projects.[33] Thus, there is not much that ESCOs themselves can do to improve their prospects. Ukrainian ESCOs need equity financing for marketing and project development including access to debt financing for energy end-users. Many ESCOs in the country realized that customer training is also a critical success factor to helping energy end-users understand the benefits of EPC mechanisms. Accordingly, Ukrainian ESCOs practically seek partnerships to attract financing and energy end-users.

Small engineering companies with in-depth knowledge of the local market have limited choice and partners with larger foreign companies with access to project financing, development and implementation.

[29] J. O'Brien, UNDP Global Forum on Sustainable Energy, "Lessons Learned from Selected Ongoing Projects," Energy Between Danube and Caucasus, The Role of Renewable Energy and Energy Efficiency as a Key Issue for Economic Development, April 2011.
[30] V. Laskarevsky, "What Institutional and Government Capacity is Currently in Place? What Additional Capacity is Required?" UNIDO CTI Seminar, page 2, October 2003.
[31] P. Bertoldi et al, "Barriers," Latest Developments of the ESCO Industry Across Europe, page 337, 2007.
[32] N. Okay and U. Akman, "Analysis of the ESCO and Country Indicators," Analysis of ESCO Activities Using Country Indicators, page 10, August 2009.
[33] W. de Wilt, Ibid.

Improved energy arrears and energy tariff reform can also play a powerful role in promoting ESCOs and EE. Another essential barrier to increasing EE activities in Ukraine is the subsidized energy tariff. When energy is subsidized or non-payments are common, consumers have less motivation to invest in EE projects. Electricity end-users (especially in the residential sector) have an energy-intensive lifestyle.[34] According to stakeholders in the Ukrainian ESCO market, low energy prices have hindered the development of ESCOs in the country.

Improving the legal basis for EPC is another important step that the Ukraine government needs to consider in promoting ESCOs. The lack of legal basis for these contracts is one more impediment that impacts the perceived risks involved and ultimately affects the number and cost of contracts signed. The legal and accounting systems in Ukraine make things more difficult for variable payment collection that is based on future performance as in the EPC concept. ESCOs in Ukraine worry that their contracts will not be upheld in court (making default easier). ESCO energy end-users are likewise concerned that tax inspectors may fine them for deducting costs for deemed “inappropriate” contracts.

[34] O. Kiva for IIIEE, “Executive Summary,” Energy Efficiency in the Residential Sector in Ukraine, page ii, June 2009.

REFERENCES

Charlie Goldman, Merrian C. Fuller, Elizabeth Stuart, Lawrence Berkeley National Laboratory, 2010, Energy Efficiency Services Sector: Workforce Size and Expectations for Growth, United States of America, 8

Energy Charter Secretariat, Third Party Financing –achieving its potential, 6

Jyukankyo Research Institute, Econoler International, 2007, Activities of ESCO Industry in Canada, 1-7

N. Hopper et al, Lawrence Berkeley National Laboratory, 2007, A Survey of the U.S. ESCO Industry:

Market Growth and Development from 2000 to 2006, United States of America, 9

P. Lamers et al, 2008, International Experiences with the Development of ESCO Markets, Germany, page 13

Shirley Hansen, Pierre Langlois, Paolo Bertoldi, 2009, ESCOs Around the World: Lessons Learned In 49 Countries, United States of America, 1-13, 79-80, 97-110, 137-143, 194-200, 204-208, 239-234, 286-292

WORLD BANK, 2010, Implementation Completion and Results Report on a Loan in the Amount of

EUR4.4 Million (USD5 Million Equivalent) to HRVATSKA ELEKTROPRIVREDA D.D.(the National Power Utility) with the Guarantees of the Republic of Croatia and a Grant from the Global Environment Facility in the Amount of USD7.0 Million to the Republic of Croatia for Energy Efficiency Project, United States of America, pages 1, 9-11.

A. Satchwell et al, Lawrence Berkeley National Laboratory, 2010, A Survey of the U.S. ESCO Industry: Market Growth and Development from 2008 to 2011, vii to ix

ECONOLER

160, rue Saint-Paul, Bureau 200, Québec (Québec), Canada G1K 3W1 Tel.: + 1 (418) 692-2592 Fax: +1 (418) 692-4899
www.econoler.com