Successfully Advancing Energy Conservation Efforts in Mexico

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ABSTRACT

To promote energy efficiency project development in Mexico, a program was developed, through the US Climate Technology Partnership, to enhance opportunities for Energy Services Companies (ESCOs). The objective of this effort is to support ESCOs from both countries to encourage business partnerships that develop energy conservation and renewable energy projects in Mexico. This is accomplished by fostering strategic alliances among Mexican and US ESCOs to promote international cooperation, technology transfer, and leverage financial resources from international lending institutions in an effort to ensure that ESCO partners are successful in developing energy efficiency projects. The benefit of these partnerships is that the partners can combine their talents and strengths to offer clients and financiers attractive turnkey projects with reduced risk and transaction costs.

Through this initiative, the US and Mexican ESCO partners have explored and are now pursuing energy conservation projects in Mexico. These business partnerships represent the first US/Mexican collaboration and negotiated projects through the US Climate Technology Partnership. As the ESCO scheme is still an emerging market in Mexico, the program team plans to capitalize on the experience and success achieved throughout this process in an effort to open Mexican markets to numerous other energy saving opportunities.

This paper discusses the details involved in these successful partnerships, the status of the Mexican ESCO market, and the strategies employed to reduce barriers to project development.

Introduction

History

Energy demand continues to increase at a rapid rate around the globe and consumption patterns generate fluctuations in energy prices. As nations struggle to meet increasing energy demand by maximizing the use of their resources, new technologies and techniques promise to alleviate the problem on the other side of the equation – by reducing the overall demand for energy. Reducing energy demand or increasing the efficiency of operating systems is not a new concept. In Mexico, the first civil group of technicians and professionals in energy applications (Asociación de Técnicos y Profesionistas en Aplicación Energética, ATPAE) was founded twenty-five years ago. In the US, this concept has been practiced for over thirty years. The Clinton Administration furthered the cause by passing Executive Order 13123, which required federal facilities to reduce their demand for energy by 30% by 2005 and 35% by 2010 (Federal Register, 1999).

This mandate propelled a specialized group of companies, ESCOs, into a vital and thriving energy services industry. By definition, an ESCO provides clients with full turnkey

services to design, develop, install and finance projects that improve how facilities operate and use energy. The performance period can last anywhere from two to twenty-five years, depending on the type of services contracted by the client. Typical services offered by ESCOs include: 1) Evaluate and determine specific energy conservation measures (ECMs) that can be implemented in a facility; 2) Design, permit, develop and implement project improvements; 3) Obtain project financing; 4) Provide operational and maintenance services or assistance to recently installed energy efficient equipment; 5) Measure, monitor and verify the decrease in energy consumption; and 6) Assume project risks (financial, energy guarantees). ESCO projects tend to be comprehensive and look at the entire building to determine which ECMs, such as lighting retrofits, heating and air conditioning upgrades, efficient motors and centralized energy management systems, will reduce the energy demand and achieve the greatest improvement to the facility.

The ESCO industry in the US is relatively advanced compared to the emerging ESCO markets around the world. A survey of thirty-eight countries conducted by Lawrence Berkeley National Laboratory noted that in 2001 ESCO activities outside the US oscillated between US$560 million and US$620 million. This amount is approximately one-half to one-third of the 2002 US ESCO revenue. Given all of the uncertainties in data quality, it is expected that international ESCO activity in 2002 will be greater than in 2001 and will be approximately 50 to 75% of US activity for that same period (Vine 2003).

The Mexican market, in particular, has numerous energy efficiency opportunities. Currently, a small but growing ESCO industry exists in Mexico, but the opportunities are far greater than the existing companies can handle, in terms of skills, technology applications and financing. Mexico has been exploring ways to improve its capacity through several strategies. For this reason, the Mexican and US governments have been collaborating to help advance the ESCO market in Mexico. The strategy of this bi-lateral program is to create partnerships between US and Mexican ESCOs, to enable the development of a greater number of projects with an expanded scope of services.

NREL/CONAE Collaboration

To promote energy efficiency project development in Mexico, the U.S. National Renewable Energy Laboratory (NREL), a laboratory of the US Department of Energy (USDOE), in collaboration with Mexico's National Commission for Energy Savings (CONAE), developed a program through the US Climate Technology Partnership (CTP) to enhance project development opportunities for ESCOs. The objective of this effort is to help ESCOs from both countries form business partnerships that lead to the development of energy conservation and renewable energy projects in Mexico.

CTP, launched in 2001, was originally funded by the US DOE, the US Environmental Protection Agency, and the US Agency for International Development to promote sustainable development, reduce greenhouse gas emissions and other harmful air pollutants, and support technology transfer under the UNFCCC through the accelerated implementation of clean energy technologies, in partnership with developing and transition countries and the business and donor community. CTP is a follow-on program to the Technology Cooperation Agreement Pilot Project (TCAPP), which originally began in 1997. TCAPP concluded in 2001 and the valuable lessons learned from this pilot project led to the development of CTP. NREL leads the CTP program in many countries, including Mexico.

CONAE has led an interagency Mexico CTP team since the start of the program. This team initially established several priorities based on previous programs developed by CONAE and other governmental agencies, building on their knowledge and experience. But, after many consultations, the NREL/CONAE team decided to focus on one priority area in order to maximize limited resources and personnel: the advancement of the ESCO market in Mexico. The objectives of the ESCO market development initiative are to facilitate the application of the ESCO strategy in Mexico and to help develop new public and private sector ESCO projects. This is accomplished by fostering strategic alliances among Mexican and US ESCOs to promote international cooperation, technology transfer, and leverage financial resources from international lending institutions in an effort to ensure that the ESCO partners are successful in developing energy efficiency projects. The benefit of these partnerships is that the partners can combine their talents and strengths to offer clients and financiers attractive turnkey projects with reduced risk and transaction costs. The near term target is to assist the project partners in advancing multiple ESCO projects in the commercial, industrial and public sectors.

Energy Demand, Status of the Electric Supply Industry and Need for Energy Efficiency

In order to successfully compete in international markets, the Mexican government has established strategies to increase the economic and social well being of its citizens. Mexico's use of financial resources in the energy sector can impact the country's ability to meet its national production and social goals. In 2002, the gross primary energy supply was 5,647 PJ[1]; national energy consumption was 6,276.4 PJ, of which 4,050.65 PJ was for final consumption. Consumption by sector was: Transport 40.3%, Industrial 30.6%, Residential commercial and public 21.0%, non energetic consumption 5.5% and Agricultural Sector 2.6% (Secretary of Energy 2003).

Mexico's power industry is based on two state owned utilities, Lyz y Fuerza del Centro (LyFC) and Comisión Federal de Electricidad (CFE). The previous and current federal administrations have proposed constitutional amendments to attract new investment partners into the power industry. The increased need for new installed capacity requires massive capital investment. As of May 2004, the proposal presented to Congress had not been approved. It is clear that a competitive market, with the active participation of the private sector, would infuse urgently needed capital into the system to develop the infrastructure and projects that will help satisfy Mexico's growing energy demand.

From 1993 to 2002, the average growth of national electric consumption was 5.0%, which was higher than the 2.7% growth in the economy for the same period. In December 2002, the demand for electricity in Mexico topped 45,674 MW, an increase of 7.6% over the previous year. Installed capacity has grown at a rate of 4.3% over the last decade (base year 1992). In the next ten years Mexico will experience a constant growth in its demand for electricity, due to the country's expanding population and economy. In order to satisfy the estimated 5.6% growth in national electric consumption in the next decade, it will be necessary to increase the sector's infrastructure by adding 25,757 MW in the public sector and 2,440 MW in self-supply and cogeneration projects. The investment required to meet this goal will be 583 thousand million pesos (Secretary of Energy 2003).

[1]PJ stands for petajoules. In the Mexico's National Energy Balance (Balance Nacional de Energía), the joule (J) is used as common unit, according to the Federal Law of Metrology and Standardization.

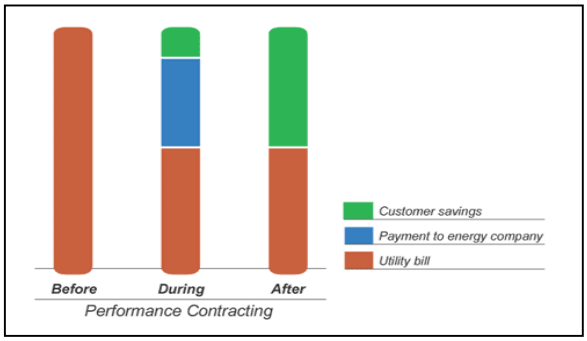
There is currently a growing interest in decreasing production costs while increasing facility efficiency in Mexico. Integrating energy efficiency into business and institutional strategies for reducing energy demand and costs is a concept that is slowly being accepted and adopted by all members of society. The Secretary of Energy (SENER), through CONAE, has initiated several programs that provide technical and advisory services to the public and private sectors on energy efficiency and renewable energy technologies, as well as enforcing energy efficiency standards, and designing and promoting policy guidelines and activities. CONAE has identified a variety of potential project opportunities. However these projects have experienced implementation difficulties, primarily due to access to financing. The high number of project opportunities in this area has encouraged the NREL/CONAE team to make their support of the ESCO market a priority, which promises to help build capacity in the Mexican market, while reducing energy consumption and greenhouse gas emissions, and increasing productivity and competitiveness in Mexican industry.

Energy Services Companies and Performance Contracting

Energy Savings Performance Contracting (ESPC), or simply performance contracting, is a way to reduce energy use and costs and renew facilities and building systems without expending capital funds. Under an ESPC, an ESCO makes an investment in identifying, installing, operating and maintaining new or upgraded energy-efficient equipment. The ESCO is compensated through the receipt of a share of the cost savings resulting from these improvements over a set term. At the end of the ESPC, the customer owns all of the improvements and receives all of the continuing savings.

The concept is best illustrated through its impact on utility bills (Figure 1). Before the performance contract, the customer pays the full utility bill. During the contract, the ESCO installs cost saving measures into facilities that are designed to reduce energy consumption and operating costs, increasing the operating efficiency of a facility. From these energy improvements, the customer achieves savings and pays either the entire savings, or a portion of the savings, to the ESCO to pay for the capital investment. The customer's share of savings can flow into operating cost reductions or be used to fund additional improvements. At the end of the ESPC, the customer receives all of the savings, enjoying reduced energy costs for the life of the equipment. Any facility in need of improvement, repair or alteration is a candidate for an ESCO project. ESCOs work with a variety of sectors including government, institutional, hospital, industrial and commercial sectors.

Figure 1. Performance Contracting



Source: Ameresco Inc.

The ESCO Market in Mexico

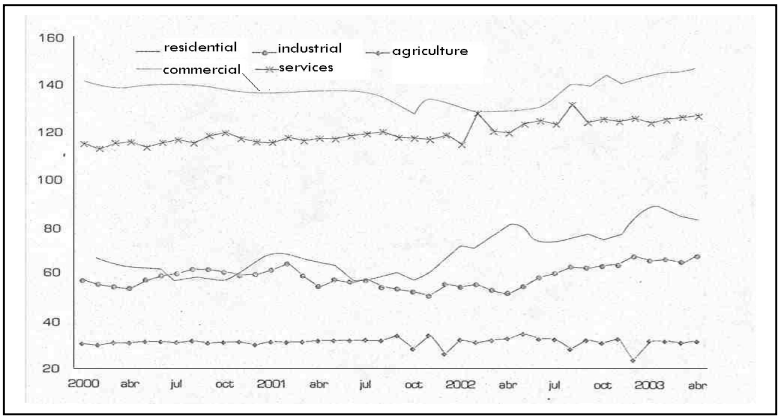
ESCO Market Description and Attracting Customers to Performance Contracting

The ESCO market in Mexico has emerged during the last decade. Prior to this, the energy efficiency market was comprised of engineering and consulting firms with a strong technical ability to identify or implement specific measures and systems to reduce energy consumption, but without the financial or technical support to offer their clients comprehensive energy services. Therefore, implementation depended entirely on the customer's financial resources or access to credit. These firms realized that to secure a greater number of clients they had to offer an integrated approach with both technical and financial energy solutions. Some of them started partnering with international financiers or other parties that gave them enough financial support to offer ESCO services.

Today, there are about ten established ESCOs in Mexico that collaborate with NREL/CONAE and have already implemented performance contracting or outsourcing projects. These ESCOs are small to medium size companies whose projects range from US$100,000 to US$5 million (CONAE 2003). In addition to the established ESCOs, there are many consulting firms that have strong technical capabilities in specific areas, and generally partner with the ESCOs to provide support during the design and development stages. Small and large manufacturers and/or distributors of energy efficient equipment also provide support to ESCOs by helping identify potential projects, supplying equipment, and providing operational and maintenance services.

Mexican companies have been forced to reduce their costs to keep up with international benchmarks. This necessity, combined with fluctuations in energy prices (Figure 2), make reducing energy costs a clear area of opportunity. ESCOs provide not only an option to cut cost, but also opportunities for outsourcing and technology upgrades that allow companies to remain focused on their core competence.

Figure 2. Real Prices of Electric Tariffs by Type of User (2002 Constant Cents of Pesos / kWh)



Source: Secretary of Energy 2003. Prospective of the electric sector 2003-2012

The Mexican Federal Administration has proposed several strategies in order to reduce its own energy consumption. ESCOs participation in federal facilities has been difficult, due to legislative restrictions that prohibit financial resources from being committed over long contract

terms. However, recent electric rate increases have affected federal office buildings, putting pressure on the government to find better ways of reducing costs. Two years ago, energy costs were increased by 2.5 times for federal buildings, making energy efficiency a very attractive solution to reduce running costs among public officials.

Projects

Some Mexican ESCOs have been successful at developing energy efficiency projects. Information on some of these projects is provided below. The CTP team provided some assistance, primarily on financing sources and follow up to the ESCOs. The sectors where services were provided included industrial and commercial facilities, ranging from manufacturing facilities to hotels and sports clubs as demonstrated in Table 1. The length of the contracts ranges from one year and nine months to ten years.

Barriers to ESCO Work in Mexico and Solutions Provided by the NREL-CONAE Collaboration

A strong relationship has been built between the CTP and the ESCO sector. ESCOs constantly provide feedback about CTP activities, ensuring that their primary concerns are included when designing the next steps for the ESCO market development strategy. ESCOs have noted that the CTP support can be very effective in helping them over come barriers to project development. An analysis of barriers and solutions provided by the NREL/CONAE team is included below.

Barrier 1: Project Financing

ESCOs in Mexico have had difficulties securing project financing, mainly because financial institutions are skeptical of energy efficiency projects, due to a lack of understanding about performance contracting and outsourcing. There are some investment resources available. For example, Fideicomiso para el Ahorro de Energía Eléctrica (FIDE), the Trust Fund for Electrical Energy Savings, which has also been active in supporting ESCO work in Mexico, has provided financing for some ESCO projects; however, the limited resources that FIDE can provide (the maximum amount is US$50,000) are not sufficient for the size of the projects.

The high perception of risk relating to ESCO projects has led to little or no participation from commercial banks in ESCO projects. National development banks, The National Bank of Public Works (BANOBRAS) and Nacional Financiera (NAFIN), have expressed their interest in participating in ESCO projects. NAFIN offers special credit lines in collaboration with the Japan Bank for International Cooperation (JBIC), the Export Import Bank of the United States (ExIm), and others. However, commercial banks have to be the filter to bridge these funds, and ESCOs have to meet the eligibility criteria of these financial institutions to access available resources.

ESPC projects require upfront investment and the economic return is periodic, depending on the performance of the project. As stated previously, in Mexico, an ESCO contract term lasts from one to ten years. When reviewers examine the creditworthiness of the ESCO, they look primarily at their balance sheet, which does not reflect an immediate return of the investment. This makes ESCOs the least desirable candidates for credit allocation. Since the Mexican ESCO may not be able to demonstrate positive profitability in their earning reports in the first period of

the contract, banks consider these operations risky and, to cover the risk, request collateral, which in most cases the ESCOs are not able to demonstrate.

Table 1. Example of ESCO Projects Developed by Mexican ESCOs in Mexico

ESCO	PROJECT AND SECTOR	CONT-RACT PD. (YRS)	ECONOMIC SAVINGS[2]	ENERGY SAVINGS	EMMISSIONS AVOIDED (CO_2 tons/yr)
OPTIMA (4 projects)	1. Pueblo Bonito Rosé / hotel	10	L.P. Gas: US$121,512 Electricity: US$37,680	L.P. Gas: 428,556 lts Electricity: 741,624 kWh	From L.P. Gas 634 From Electricity: 519
	2. Pueblo Bonito Los Cabos (Blanco) / hotel	10	L.P. Gas: US$71,220	L.P. Gas: 228,492 lts	From Gas 338
	3. Omni Cancún Hotel & Villas / hotel	10	N.D.	Diesel.- 44,124 lts L.P. Gas.- 70,008 lts. Electricity.- 1'191,024 kWh	From Diesel: 114 From Gas: 104 From Electricity: 833
	4. Pueblo Bonito Sunset Beach / hotel	10	L.P. Gas: US$122,352 Electricity: US$78,718	L.P. Gas: 448,728 lts Electricity: 1,707,192 kWh	From L.P. Gas: 664 From Electricity 1,195
Ecotherm de México (3 projects)	1. Hotel Sheraton María Isabel / hotel	5	1´751.040 pesos per year	364800 lts of diesel per year	944 ton CO_2 per year.
	2. Club Cantil / sports club	3	720,000 pesos per year	144,000 lts. of diesel per year	373 ton CO_2 per year
	3. Club Berimbau / sports club	5	1´209,000 pesos per year	252,000 lts. of diesel per year	652 ton CO_2 per year
Empresas ESM (3 projects)	1. Maquiladora Produr / industrial	1 year 9 months	US$120,374 per year	876,960 m^3= 7,585 Gcal of natural gas per year	N.D.
	2. Masterpak – Planta Celorey I / industrial	N.A.	224,184 pesos per year	574,312 kWh per year	402 ton CO_2
	3. Masterpak – Planta Celorey II / industrial	N.A.	391,527 pesos per year	1,002,963 kWh per year	702 ton CO_2
Diram (4 projects)	1. Rapid Plastics de México / industrial	2	435,000 pesos per year	120,000 KWH	84 ton CO_2 per year
	2. Compañía Papelera Maldonado / industrial	2	960,000 pesos per year	1,000,000 KWH	700 ton CO_2 per year
	3. Proteínas Básicas / industrial	2	210,000 pesos per year	14,400 KWH	11 ton CO_2 per year
	4. Brown and Sons de México / industrial	2	108,000 pesos per year	10,800 KWH	7 ton CO_2 per year

Source: CONAE 2002. Based on the Successful Case Stories Portfolio information provided by Mexican ESCOs

Even though some ESCOs in Mexico have been successful in securing financing, after financing a few projects, the ESCOs have little to no debt capacity left available, and no collateral left to cover the risk. This lack of equity has resulted in ESCOs not being able to continue engaging in more projects, since they cannot qualify for further credit. Several ESCOs have been forced to invest private resources in order to continue project commercialization.

Strategy 1: project financing. The high risk perception of performance contracting, as well as a lack of company equity, makes it difficult for ESCOs to access funds. To change this

[2] The currency exchange rate as of May 14, 2004 is $11.35 pesos for US$1

perception, the NREL/CONAE team has been promoting the benefits and project successes of performance contracting with financing sources. The CTP team has focused on gathering information on successful Mexican ESCO projects and prepared a portfolio for review by financiers and potential end-users. CTP also held an International ESCO Seminar in December 2002, where CTP gathered national and international ESCOs, financial institutions, manufacturers and distributors of energy efficient equipment, and other parties involved in the market to discuss the financing barriers for ESCO projects. In addition, CONAE has provided a technical opinion of proposed projects to some financial institutions, which has helped mitigate the project risk perception.

In relation to the ESCOs lack of equity, the CTP team has linked ESCOs with equity funds like FondElec Latin American Clean Energy Services (FLACES) and the Clean Tech Fund, by providing information about the ESCO and arranging meetings between the parties. As a result, one ESCO has financed a project and is in the process of receiving allocations for three additional projects. Also, the CTP team is designing a draft proposal to establish a Loan Guarantee Fund to help ESCOs access financing more easily. ESCOs have highlighted the relevance of establishing such a fund, which would help them alleviate some aspects of the financing barriers

Barrier 2: Lack of Understanding of How ESCO Projects Work

Many energy end-users are accustomed to doing business a certain way. Therefore, they are often reluctant to accept possible operational and maintenance alternatives for their facilities, or to allow another company to conduct work in their facility for fear it may interfere with facility operations. Some customers are leery of the process, stating that the energy savings seem 'too good to be true', others are reluctant to contract with an ESCO because they do not want them to profit from the efficiency upgrades, and others still share the attitude that 'if it is not broken, then why fix it'.

Strategy 2: Lack of understanding of how ESCO projects work. NREL and CONAE have worked with ESCOs and customers to provide credibility to the process by offering technical support and follow-up in the negotiations. CTP's presence, as a neutral third-party, provides transparency and credibility to the project process. In addition, the CTP team has organized eleven events (workshops and site visits) to raise awareness on performance contracting and outsourcing, as well as to facilitate collaboration among energy end-users, financial institutions, ESCOs, consulting firms, manufacturers, and distributors to identify specific project opportunities. Outreach has been conducted to the Industry Chambers of Commerce, Hotel Associations, about ninety energy end-users, and fifty companies. All these efforts, together with other CONAE national programs with large energy consumers, municipalities, and small to medium size companies, have helped increase customer's demand for ESCO services. Additionally, the CTP team gathered information on ESCO projects in other countries, information about the basics of ESCOs, databases, potential project opportunities, successful cases portfolio, and posted it at: http://www.conae.gob.mx/wb/distribuidor.jsp?seccion=27.

Barrier 3: High Transaction Costs

Since the ESCO market is new in Mexico, there are few standardized procedures or rules that ESCOs need to follow for performance contracting. Concerns, such as identifying a credit worthy partner, customer and financing, and selling ESCO services, are critical in promoting

ESCO services. Another important issue is how the ESCO approaches the customer. Another challenge is the long evaluation and sales cycle for an ESCO project. The negotiation of and actual ESCO project could take from one to three years, depending on certain factors, and some companies lose interest or find that it is an economic burden to engage in a project for such a long period of time. Additionally, devising the legal documents related to the performance contract involves technical, financial, and legal expertise that is difficult to find, and costly once employed. Mexican ESCOs have spent considerable human and economic resources to develop standard contracts that would maintain the integrity of the project and protect the ESCO's capital investment. Another challenge is project size. ESCO projects in Mexico tend to be smaller in scale, from US$100,000 to around US$5 million. The cost of accessing financing is very high, which makes some small projects not economically viable.

Strategy 3: High transaction costs. The NREL/CONAE team has put a lot of effort into assisting ESCOs by facilitating activities which have allowed them to keep focusing on their core mission. This support has been effective in helping ESCOs and energy end-users to maintain interest and continue to pursue project implementation. As a result, as of May 2004, there have been two signed ten-year projects in the hotel sector for US$3.4 million and US$3.3 million respectively, and at least four more proposals are under negotiation. CTP has gathered information on potential project opportunities and developed a portfolio of ten project briefs with an estimated investment of around US$28,765,131. These project identification efforts reduced the time and costs involved in qualifying potential projects.

The team has also developed specific documents and tools, which provide guidance. The Guide to the ESCO process (CONAE 2000), where the reader can get information on the desirable characteristics of both an energy end-user and an ESCO when selecting a counterpart, also gives information on the process of an ESCO project. Also, the CTP team is in the process of developing guidelines to developing a performance contract.

The size of the projects Mexican ESCOs usually develop also has a direct effect on the transaction costs. Increased risk and high interest rates result in high transaction costs to implement the projects. The World Bank, in response to the needs of the energy sector in Mexico, is currently developing the ESMAP innovative financing initiative for Energy Efficiency Projects in Mexico. This effort aims at reducing these transaction costs by establishing a legal and financing mechanism that will bundle projects. As part of this effort, documentation, such as performance contracting, energy auditing and monitoring, and verification protocols will be developed. Direct work with ESCOs and support organizations will be part of the initiative. SENER and the US DOE have been involved in this initiative since its design stage. The CTP team has been assisting this effort by providing information about the Mexican market, introducing and facilitating meetings between the World Bank's consultant and the key players in the ESCO market. Additional areas of support are under consideration.

Barrier 4: Regulatory Constraints for ESCO Project Development in Federally Owned Facilities

Mexican regulations have inhibited energy efficiency project development in the public sector, due to the regulation that prohibits entities from entering into long-term financial obligations without the authorization of the Treasury (Secretaría de Hacienda y Crédito Público). Although it is possible to get authorization, the process is complicated and time consuming.

However, some recent work by the Investment Unit of the Under-ministry of Expenditures of the Treasury (which has imported from the UK the Private-Public Partnership or PPP's) could provide the framework that ESCOs require to enter the public sector (Partnerships UK 2004). Even though there are some differences between the types of projects that would fit into to PPP's, this could be the key to facilitate the introduction of the ESCO concept to federally owned facilities, implement some projects, and, once the parties involved are more comfortable with this financial alternative, design the suitable framework for ESCO project development.

Strategy 4: Regulatory constraints for ESCO project development in federally owned facilities. The Secretary of Energy, through its Deputy Secretary of Energy Policy and representatives of the CTP, provided assistance to an ESCO interested in entering the public sector. This ESCO has designed a mechanism that will allow the update of equipment and systems, and reduce energy consumption in federally owned facilities, with the current legislation. The SENER/CTP team participated in meetings with the Ministry of Treasury in order to examine the possibility of fitting this ESCO's offerings into the PPP framework. This ESCO has been gathering information of potential project opportunities to integrate a set of pilot projects. The process has been very slow, mainly due to the resistance of public entities to enter into such an innovative scheme. CTP will continue providing assistance to this ESCO and any other company interested in entering this sector.

Additional Strategies: Strengthening ESCOs Offerings by Establishing Partnerships

Establishment of partnerships among international and Mexican ESCOs is of particular interest of the CTP effort. As a result of the CTP efforts, some of these companies have engaged in business. Such is the case of financing organizations like Sumitomo, FondElec, and the Clean Tech Fund. Mexican ESCOs are not only interested in obtaining financing from other institutions to develop projects, but in acquiring sustained knowledge to diversify their offerings and, as result, build their business. The creation of strategic alliances helps promote international cooperation, technology transfer and leverage financial resources from international lending institutions, in an effort to ensure that ESCO partners are successful in developing projects. The benefit of these partnerships is that the partners can combine talents and strengths to offer clients and financiers more attractive turnkey projects with decreased risk and transaction costs.

The CTP team has encouraged participation from a variety of international ESCOs since the start of the program. One US ESCO, Ameresco, has demonstrated strong interest in partnering with Mexican ESCOs to pursue project development. Because of this great interest and dedication, the CTP team has worked closely with Ameresco and Mexican ESCOs for the last year, to identify potential energy efficiency project opportunities in Mexico. For Ameresco, having a local partner brings added value, particularly with regards to local permitting, development options, and other cultural considerations. For the Mexican ESCOs, establishing a partnership with Ameresco provides access to international financing and broadens their service offerings to their clients. The energy end-user benefits from this partnership from having an experienced group of professionals working at their facility to reduce their energy consumption at little to no cost. The CTP team has organized a variety of events to facilitate meetings among Ameresco and Mexican ESCOs, as well as with potential end-users, for example, the site visits held in February 2004. All of the energy end-users were very interested in pursuing project

development. As a result of the meetings and site visits, a number of projects are under negotiation, with an investment potential of up to US$50 million. This kind of alliance is a win-win situation with considerable benefits to all parties involved.

Advancing the development of these ESCO projects is one of the priorities of the CTP team. Should projects be implemented, they would be the first to be developed jointly by Mexican and International ESCOs, bringing together use of clean energy technologies and GHG emissions reductions, along with a strong capacity building and a business opportunity component. The CTP team will continue to focus on providing close follow-up to the agreements made, offering technical support and facilitation of negotiations. In addition, the CTP team will assist in identifying finance options, which currently is the largest barrier to advancing the projects. The CTP team has the advantage of being a matchmaker and third-party neutral broker of the process with no monetary interest, allowing all parties involved to trust and encourage CTP participation.

Conclusions

As noted throughout the paper, ESCOs in Mexico face a variety of barriers related to high transaction costs, regulation provisions, and lack of general awareness and understating of performance contracting and outsourcing. However, the barriers that are most critical to the majority of ESCOs, and firms willing to offer ESCO services, are those related to financing.

In order to address the many barriers ESCOs face, the NREL/CONAE team has carried out a set of activities to enable the ESCO market development in Mexico. The approach includes working directly with ESCOs on specific projects, as well as developing the necessary elements that will help reduce the main barriers that ESCOs have been facing. Activities developed fall into the following lines of action: 1) Promotion of the ESCO process; 2) Supporting ESCOs on project development; 3) Development of support documents and tools to reduce transaction costs; 4) Catalyzing activities and helping to establish partnerships; and 5) Identification of and access to various finance strategies.

Through these efforts, the CTP team has learned many valuable lessons. Much of the success of the program has been achieved due to the constant interaction and communication the CTP team has provided to all the parties involved. The projects Ameresco is now exploring with three Mexican ESCOs can be attributed to the attention and detail the CTP has provided in maintaining the constant stream of communication and shared information, and the overall collaboration between ESCOs and energy end-users. The CTP team continues to educate energy end-users of the great benefits that can be gained through energy savings retrofits, which helps expand the database of potential projects. In addition, the CTP team has place more effort in reaching out to the finance community to increase finance options for ESCO projects in Mexico. Through the efforts of the CTP team, as of March 2004, two projects have been signed, and four other projects are in the negotiation stage. In relation to partnerships among ESCOs, two non-disclosure agreements (NDAs) among ESCOs have been signed and there another three are under negotiation, which demonstrates the success of the program.

Addressing the finance barrier, strengthening the offerings of ESCOs, and advancing the development of ESCO projects in Mexico through facilitating business partnerships and educating energy end-users, will continue to be the main priority of the CTP team. The CONAE/NREL team continues to receive positive feedback from all parties involved which

encourages the CTP team to continue its efforts in advancing the ESCO market in Mexico until it expands into a sustainable market.

Although many successes have been achieved to date, a great need still exists for assistance from the finance world. Assistance from local banks, as well as the international finance community, will need to play an increasing role in order to build a larger ESCO market in Mexico. Current efforts by the World Bank, SENER and other agencies are beginning to recognize the important role ESCOs play in the energy sector, and will help shape the future of the ESCO market through their continued interest and support.

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