Tapping the Potential for Energy Efficiency: The Role of ESCOs in the Czech Republic, Ukraine and Russia

By Meredydd Evans, Pacific Northwest National Laboratory

ABSTRACT

Energy service companies have played a significant role in stimulating energy efficiency in many industrialized countries, including the United States. Many policymakers and development experts consider energy performance contracting an important mechanism for boosting energy efficiency in other countries as well. The experience of ESCOs in transition economies, however, is decidedly mixed. The Czech Republic has been able to foster a thriving ESCO industry with numerous players competing for business, although ESCOs have encountered problems along the way. In Russia and Ukraine, ESCOs have developed slowly, and few true performance contracts exist.

This paper reviews the experience of ESCOs in the Czech Republic, Ukraine and Russia and then explores the factors shaping the diverse trends in these countries. The paper draws on the experience of the national energy efficiency centers, development banks, bilateral assistance organizations and individual ESCOs in promoting ESCO industries. Factors that have influenced ESCOs to date include the economy, the price of energy, the financial situation of potential clients, the legislative basis for ESCO activities, the business experience of ESCO staff and access to information about the ESCO concept. Financing has also proven to be a critical factor in developing ESCOs. Lack of project financing and guarantees, for example, is a major problem in the former Soviet Union. The paper concludes by drawing recommendations for policymakers and industry on promoting ESCOs.

Introduction

Energy performance contracting has played an important role in promoting energy efficiency in many developed nations. Such contracts can reduce many of the difficulties companies often experience in implementing energy efficiency projects because they provide for a comprehensive package of services. These services include project development and management, financing, procurement, installation, maintenance and monitoring. The services are bundled together and repaid through energy savings so the customer has to pay very little if anything out of pocket. ESCOs also guarantee the savings, so customers assume little technical risk. Such a model seems quite appealing for the cash-starved transition economies. The potential energy efficiency gains from energy performance contracting are also important to countries in transition which are typically significantly more energy intensive than Western Europe or the U.S. The causes of this inefficiency are many, though the historical lack of market signals has played a major role in encouraging excessive energy use.

This paper examines how well ESCOs have fared in three transition economies: the Czech Republic, Ukraine and Russia. These countries combined represent large potential new markets for ESCO services. The Czech Republic, while smaller than the other two

countries, has very valuable experience to share with all countries in transition because it has already made significant progress in establishing an ESCO industry. The experience in Ukraine and Russia will also be relevant for other countries in transition, particularly those that have faced the greatest economic difficulties in the past decade.

Each of these three countries has taken its own path toward market economics and development. The Velvet Revolution in the Czech Republic launched major economic and political reforms in 1989. Mass privatization proceeded quickly, as did price and other economic reforms. The economy has grown since 1989, but in fits and starts with alternating periods of recession. Ukraine and Russia, on the other hand, have not seen sustained economic growth in over a decade. Russia has implemented more widespread economic reforms than Ukraine, but international lending agencies, such as the International Monetary Fund, have criticized both countries for their lack of adequate progress on reform. In each of these three nations, energy prices are still often subsidized, though to varying extents.[1] Overall, prices in the Czech Republic are much higher than those in Ukraine and Russia. Table 1 below summarizes some of the key economic and energy characteristics of the three countries (BCEO, 2000; EIA, 2000; IEA, 1999; Chandler, 2000; Zeman, 2000).

Table 1. Key Economic and Energy Indicators, 1999

Indicator	Czech Republic	Ukraine	Russia
GDP (bill. $)	53.5	30.8	182.2
GDP growth, 1999 (%)	-0.6	-0.4	1.7
GDP growth, 1990-97 (%)	-0.8	-57.0	-39.6
Foreign investment (bill. $)	4	0.5	2.2
Energy intensity (Btu/1990 $ GDP)	56,200	95,500	74,200
Average electricity prices (¢/kwh)	3-10	3.5	1.0
Average gas prices ($/th. m^3)	160-190	30	13
Notes: Gross Domestic Product (GDP) figures for 1999 (first two rows) are in nominal dollars, without reflecting purchasing power parity. All other GDP-related figures are based on GDPs in 1990 dollars. Czech energy prices reflect the range paid by different types of consumers. Ukrainian gas prices are for cash payments in industry and Ukrainian electricity prices are an average of industrial rates. Russian energy prices are for industry. Energy prices have been converted into dollars at market exchange rates and do not take into account purchasing power parity or income differences in each country.			

The Czech Republic

The Czech Republic is an industrialized country transitioning to a market economy. Brown coal and lignite have been major energy sources historically, and partly as a result, the country contributes a large volume of greenhouse gases per capita. The Czech Republic launched extensive reforms in the early 1990s, which has encouraged investment. Market-oriented laws also encouraged the development of the ESCO industry. Energy prices are higher than they were a decade ago, but they are still regulated and in some cases subsidized. Economically, though, the story is somewhat mixed. Some reforms were hastily enacted, and did not stimulate the economy as expected. Voucher privatization, for example, failed to bring new capital and management into many large Czech industrial companies, so they stagnated. The Czech Republic has experienced two recessions since 1990, although the

[1] In most countries in the region, residential energy prices are lower than industrial prices. Commercial prices vary depending on the type of customer and the degree of regulation in each country.

country has also seen years of strong growth. The currency has been rather stable, inflation has been between 8 and 11% in most years, and nonpayments are not a systemic problem as they are in Russia and Ukraine. Because demand for energy efficiency is growing as companies and cities try to reduce their energy bills, the energy services industry has continued to grow despite economic decline in other sectors of the economy.

Dynamics of the Czech ESCO Market

The ESCO concept has fared well in the Czech Republic. The concept was first introduced there in 1992, and today there are more than ten ESCOs, which combined have implemented or negotiated dozens of projects. A subsidiary of U.S.-based Energy Performance Services (EPS) was the first to tap this market with assistance from the Czech Center for Energy Efficiency (SEVEn). Soon after, several Czech ESCOs were launched and more foreign energy service companies began testing the Czech market. ESCOs working in the Czech Republic today include: EPS CR; Stredisko pro Uspory Energie (SUE); Siemens (formerly Landis and Gyr); Honeywell[2]; and smaller companies such as DHV CR; EGF; EGU Praha; Terranova-Industrie and Thermodat (Diduskova, 1997), although not all of these use performance contracts. EPS, SUE and Siemens dominate the market. Several ESCOs focus on niches within the market, such as insulation or boilers.

SEVEn conducted a detailed study of the Czech energy market in 1997, at which time 9 projects had been implemented, 5 were under construction and 11 were being negotiated (Diduskova and Marousek, 1997). The projects ranged in size from 456,000 to 78,000,000 Czech crowns (or $14,400 to $2.27 million). Since that time, several more projects have been implemented though the general types and sizes of projects have remained approximately the same. Schools, hospitals and industry account for the majority of projects. Both hospitals and industry have proven somewhat unreliable project sites. The depressed financial situation in most hospitals leads them to repay their performance contracting obligations months late, while economic slowdowns in industry mean that projects are often not as cost-effective as planned. School projects have been particularly profitable for ESCOs, as have been the few district heating system projects implemented with performance contracts (Diduskova, 1997; Marousek, 2000). Table 2 below summarizes the ESCO projects in place or underway in the Czech Republic in 1997 (Marousek, 1997).

Table 2. ESCO Projects in the Czech Republic, 1997

Type of Facility	Number of Projects
Schools	9
Hospitals and clinics	5
Industry	8
Residential and commercial	2
District heating systems	1
Projects mean those that were implemented, under construction or under negotiation at the time of SEVEn's assessment of Czech ESCOs.	

[2] Honeywell per se is not currently operating as an ESCO in the Czech Republic, though it does have a major business of selling controls and related equipment, and it helps customers structure financing.

Most ESCOs in the Czech Republic finance their projects with bank loans, though a few have internal sources of capital to draw from. Bank interest rates have ranged from approximately 10-20% annually, which is low compared to many other countries in transition. EPS CR, which was recently bought by the German utility MVV, has access to internal capital for project financing, though it has also used third party financing. Siemens can tap internal corporate funds as well as a multi-project facility it has created with the European Bank for Reconstruction and Development.

Several public programs have also encouraged the development of Czech energy performance contracting. The Czech Energy Agency, for example, provides subsidies for energy efficiency investments that ESCOs have tapped (Marousek, 1997; Diduskova, 1997).[3] This can increase the return on a project for all parties. The U.S. government has supported seminars and general assistance to new ESCOs in the Czech Republic through SEVEn. For example, energy performance contracting was first discussed in depth in the Czech Republic at SEVEn's 1992 Energy Efficiency Business Week. The European Union's PHARE program provided 5 million ECU to create an energy efficiency fund that ESCOs and other companies could use to finance projects. This fund opened in 1997 and is administered through the Czech bank, Ceskoslovenska obchodni banka (Diduskova and Marousek, 1997). PHARE also sponsored a one-week, intensive course about energy performance contracting for potential ESCO managers and the Charles Mott Foundation sponsored a manual on developing energy efficiency projects. The European Bank for Reconstruction and Development (EBRD) has also played a role in developing the Czech ESCO market by providing multi-project financing for new ESCOs throughout the region.[4]

Monitoring and evaluation of project savings has not been standardized, though many foreign ESCOs in particular have extensive experience with monitoring and evaluation elsewhere that they apply in the Czech Republic. The International Monitoring and Verification Protocol (IMVP) has been translated into Czech, Russian, Ukrainian and many other languages in the region; this document, which was first developed in North America, provides guidelines to better monitor projects and ultimately improve their performance. The IMVP is completely voluntary, though several international banks do encourage or require its use for energy efficiency projects that they finance. ESCO projects implemented in the Czech Republic appear by and large to have achieved significant energy savings.

While the ESCO market is more active in the Czech Republic than in countries to the East, the path has not always been simple. Economic decline has reduced the profitability and viability of private sector projects. Comparatively low energy prices and energy subsidies make energy performance contracting less profitable in many cases.

Government regulations have also stood in the way of public-sector projects, particularly at the national level. Until recently, the Czech Ministry of Finance did not allow energy performance contracts under government contracting rules. SEVEn prepared detailed recommendations to the Ministry on how to allow performance contracting in competitive tenders, and as of this year, the Ministry now allows performance contracts in a two-stage process with an energy audit prior to the main tender.

---

[3] The Czech Energy Agency provided grants for five projects from 1994-97. These grants totaled over $600,000 and additional grants for new projects have been provided since then.

[4] According to Peter Hobson in EBRD's Energy Efficiency Unit, none of the regional multi-project facilities for ESCO financing have been used for projects in the Czech Republic, though the mechanism covers the Czech Republic.

Lack of familiarity with energy performance contracting among potential customers is also a major barrier. Many ESCOs in the Czech Republic feel that one of their biggest challenges is in educating and convincing their potential customers that performance contracting is profitable (Slavotinek and Votapek, 1998; Kula, 1998; Novak, 1998; Novak, Knizek and Slavotinek, 1996. Individual ESCOs can address this problem on their own through hard work, innovation and ultimately competition. That said, public support to raise awareness about energy efficiency and the potential of energy performance contracting could also help the Czech ESCO industry grow.

SEVEn estimates that the ESCO market potential in the Czech public sector is about $10 million per year. Overall, the Czech energy services industry has made great progress in tapping market opportunities since it began less than a decade ago. Public-sector support of performance contracting appears to have played an important role, but so have the relative economic stability of the country, the availability of financing and the business acumen of the ESCOs involved in this market.

Ukraine

The economic situation in Ukraine has had a major influence on potential energy efficiency investments. The Ukrainian economy has declined each year since independence in 1991 and is now less than half the size it was a decade ago. The first few years after independence saw hyperinflation, which led companies to trade by barter in order to limit monetary risk. Energy arrears have also been a major problem, particularly in the state sector. When a company does not pay for energy, energy efficiency is rarely economical. Inflation, barter, and nonpayments have driven interest rates up as high as 300%, though they are currently between 25 and 60% for most commercial customers. Privatization has also been less extensive than in neighboring nations. As a result, energy efficiency projects are often very difficult to finance and implement.

Ukrainian ESCOs

The ESCO industry in Ukraine is quite new. Most energy efficiency companies working in Ukraine do not use performance contracting, nor can they provide financing for projects. The Ukrainian Energy Services Company (UkrEsco) is the only ESCO in Ukraine with significant financing available specifically for energy efficiency. Several regional ESCOs have also been created, and foreign ESCOs have also tried to enter the Ukrainian market, though none is able to provide the full range of services of a typical ESCO.

UkrEsco is a state-owned energy service company with access to approximately $36 million in loan and grant financing from the EBRD and the European Union's technical assistance program, TACIS. The State Committee on Energy Conservation is the nominal owner, and the Ministry of Finance is responsible for the sovereign guarantee that secures the $30 million EBRD loan. TACIS is providing 3 million Euros in funding for the project management unit, run by Econoler (a Belgian ESCO) and Nexand (previously known as Bechtel Consulting, Ltd.), and an additional 3 million Euros for grants to subsidize 10% of the cost of each project. The Pacific Northwest National Laboratory and its partners, the Ukrainian Energy Efficiency Center and Industrial Real Estate, are collaborating with UkrEsco to prepare projects for financing.

As a result of its financial and corporate structure, UkrEsco can provide a full package of services including financing and project implementation. EBRD typically does not finance public-sector companies, but they did so in this case to stimulate the market because no other companies had been willing to make equity investments in ESCOs in Ukraine. The Ukrainian government plans to privatize UkrEsco when it becomes profitable, though no exact date has been set. UkrEsco signed its first performance contract in April 2000; the contract is with Gostomel Glass Plant and is worth approximately $350,000. UkrEsco's board has also approved or is considering projects at breweries, wineries, a tire manufacturer and an abrasives plant.

Several foreign companies have also considered operating as ESCOs in Ukraine, including some that were first invited to Ukraine under technical assistance programs. For example, the Alliance to Save Energy has worked with the U.S. ESCO Facilities Management Control Systems in Lviv on a consulting basis. A U.S.-Ukrainian consulting company called PCG also registered a subsidiary called PCG-ESCO, but the company has not yet signed any energy performance contracts (PCG, 1999).

U.S. AID also helped establish several regional energy service companies including ESCO-East, ESCO-Center and ESCO-West. ESCO-West, for example, has a program to help Ivano-Frankivsk oblast meter electricity region-wide, which has helped the regional government reduce its energy debts. ESCO-Center, based in Slavutich, has also been active in heat system modernization and installation of meters, though it, like ESCO-West, has no financing for such projects. ESCO-East did receive a U.S. AID grant to help it finance projects, but the company has since run into financial difficulties. Because commercial bank financing is available only at very high interest rates and for periods of under a year, performance contracts are rarely profitable with such financing. Instead, the regional ESCOs implement projects and provide advice with traditional payment for services (not for performance). These ESCOs have also joined forces under the national Association of ESCOs (AESCO), which has received financial and technical support from U.S. AID.

There are also numerous engineering and consulting companies in Ukraine that provide energy efficiency services, but the author is not aware of any that use performance contracting. Many of these organizations are small and/or are associated with Ukrainian technical institutes.

Industry is likely to be the major source of ESCO projects in Ukraine for the next few years because industrial plants can provide collateral and guarantees, private industrial plants have lower energy arrears than most state-owned organizations such as district heating systems, and profitable manufacturers can be found. Publicly financed projects such as the World Bank's Kyiv Public Buildings Energy Efficiency project will also likely provide opportunities for ESCOs, though not necessarily through performance contracts. Public buildings in smaller projects such as those for individual schools and hospitals will also probably attract some ESCO-type projects, particularly in facilities that have metered heat supply (Raptsun, Surnin and Shestopal, 1999).

The Ukrainian government has played a major role in developing UkrEsco. Regional and local governments have also funded energy efficiency projects, though there are no major national mechanisms for subsidizing energy efficiency projects, as in the Czech Republic. Neither have there been large projects to train local specialists on energy performance contracting. President Kuchma and the Cabinet of Ministers recently signed decrees launching a "Federal Energy Management Program," and the Ukrainian government

has expressed interest in promoting private energy performance contracting as a means of raising energy efficiency in government-owned facilities.[5]

The Ukrainian government could also help promote ESCOs by establishing a legal basis for energy performance contracting. This and the corresponding absence of established accounting regulations and tax rules that can accommodate performance contracting are major obstacles to creating an ESCO industry in Ukraine. Ukrainian legislation does not clearly allow energy performance contracting, so by default, many potential ESCO customers fear that they will be excessively taxed for ESCO services or their energy performance contracts will be annulled.

Russia

Russia is home to numerous companies that provide energy services, yet most do not use energy performance contracting. The economic situation in Russia has been similar to that in Ukraine, though the economy did grow in 1997 and 1999. Privatization has progressed more rapidly in Russia than in Ukraine. A larger share of Russia's economy is now in private hands than is the case in many Western European nations. Russia is also one of the world's major energy suppliers because of its oil and gas deposits. Energy prices in Russia are very low compared to those in most industrialized countries. Energy arrears have also been a significant problem, and barter remains a major means of settling accounts. As a result, the Russian government has consistently listed energy efficiency as a government priority, though government funding has not always followed.

Russian Energy Services

Several companies have tried to provide energy services and energy performance contracting in Russia, though it would be premature to say that there is an ESCO "industry," as there is in the Czech Republic.

EPS, a U.S. ESCO, has implemented a $10 million project based on an energy performance contract and World Bank financing in the Karelsky Okatysh iron ore mining and pelletizing plant. The project ran into some repayment difficulties after implementation began, and as a result, EPS is not planning further projects in Russia for the time being. Other foreign companies such as Honeywell have also considered launching performance-based projects in Russia, though the author is aware of none that have been signed to date. Since the ruble devaluation in 1998, companies selling foreign equipment have been at a disadvantage because their prices have become quite high compared to their Russian counterparts, and payback periods have been longer.

---

[5] The President of Ukraine issued a decree in June of 1999 "On Measures for Reducing Energy Consumption by Budgetary Institutions, Organizations and State Enterprises" and the Cabinet of Ministers issued a similar decree on December 30, 1999. These decrees theoretically provides a legal basis for using energy performance contracts in the state sector, although many details of how the decrees will work in practice to promote ESCOs (including tender rules) have not yet been worked out. The Ukrainian government does plan to further develop these legal mechanisms.

Russian-owned companies have also started energy service companies. Moscow-based Negawatt is one example (Aslanian, 2000; Negawatt, 1998; Aslanian and Molodtsov, 1996). Negawatt is a private company; 20% of the shares belong to the Centre for Energy Policy and the rest belong to other private investors. Negawatt has held discussions with EBRD about receiving up to $5 million in financing for ESCO projects. However, EBRD has decided not to proceed with the project because of the high economic risk in Russia generally and the lack of private capital involved in the Negawatt deal specifically. (The Russian Ministry of Science and Technology, though, was willing to invest up to $2 million as part of the deal.) Despite limited internal equity, Negawatt has successfully implemented a series of performance contract projects in the public sector, primarily in hospitals. It receives a fixed payment from these projects quarterly once the agreed-upon energy savings are verified. Negawatt was able to leverage $110,000 of its own funds to later obtain additional grant financing from the U.S. Department of Energy and the United Nations Foundation for hospital retrofits in Moscow (Aslanian, 2000; DOE, 1999).

The European Bank for Reconstruction and Development also reviewed a proposal for creating a separate ESCO with Menatep Bank and the Russian industrial association Rosprom in 1996, but decided against the investment (Rosprom, 1996). Since 1998, EBRD has limited its investments in Russia overall.

The European Union's Energy Centres in Ekaterinburg and Novosibirsk have also considered launching energy performance contracting activities. The Energy Centre in Novosibirsk has converted itself into a private engineering and consulting company with a long-term goal of becoming an ESCO. The company's commercial director, Vladimir Baidakov, cites the legal and economic limitations as the major roadblocks to launching the company as an ESCO today (Baidakov, 2000).

A non-profit partnership in Moscow called "Energy and Resource Conservation" is also working to launch a new ESCO called RusEsco. RusEsco was registered in January 1999 and its mission includes attracting financing, conducting energy audits and monitoring and installing equipment. RusEsco is currently looking for financing to expand its activities and allow it to implement projects in the district heating and industrial sectors (Kochergin, 2000). It has not yet implemented any projects with performance contracts, though.

Numerous other Russian companies also provide engineering and consulting services, but they do not operate as ESCOs and they generally do not have access to any significant amounts of financing, debt or equity.

Financing became an even more vexing problem after the 1998 market crash. Russian banks had begun to provide some financing for energy efficiency before the crash, but many of these banks have since gone bankrupt or have significantly reduced their lending activities. The financial crisis has also meant that many potential customers are now less creditworthy and viable, as demand has slumped for goods and services. As mentioned earlier, the ruble devaluation has also had a major impact on the economic value of energy efficiency investments. Energy prices are ruble denominated and are generally rather low compared to those in other industrialized countries. Negawatt, for example, feels that low energy prices are the most important barrier to ESCOs and energy efficiency in Russia. Many energy efficiency products, however, are imported and are now more expensive, meaning that pay back times for imported equipment are often two to three times longer than they were previously. (An interesting side effect of this trend is that Russian producers of

energy efficiency equipment and materials now have a competitive advantage and seem to be increasing both production volume and quality.)

Conclusions and Recommendations

Economic conditions and energy prices clearly play a major role in the development of ESCOs. Likewise, the availability of financing is a key factor because without financing, energy performance contracting is not possible. Lack of financing after the Russian financial crisis in 1998, for example, appears to have had a negative effect on the growth of the Russian ESCO industry. On the positive side, the economies of most countries in transition have seen growth or at least a slowdown in the decline, which will make financing easier to obtain in the future. Also, joint implementation and emission trading will likely provide additional economic incentives for energy efficiency in the region, assuming the Kyoto Protocol and its binding restrictions on carbon emissions enter into force.

Energy tariff reform and improved collections can play a powerful role in promoting ESCOs and energy efficiency. When energy is subsidized or nonpayments are common, consumers have less incentive to invest in energy efficiency. Low energy prices in Ukraine and Russia have hindered the development of ESCOs according to individuals involved in this market. On the other hand, the relatively strong development of ESCOs in the Czech Republic is probably also related to the higher energy prices there. Raising energy prices is rarely popular, but it is a critical step in economic reform.

Improving the legal basis for energy performance contracts is another important step that governments can take to promote ESCOs. The legal basis for these contracts can affect the perceived risk involved and, ultimately, the number and cost of contracts signed. In the Czech Republic, the legal system supports the right of ESCOs to collect payment based on the performance of their energy saving investments at client facilities, although no specific legislation defines the rights and obligations of ESCOs or terms of energy performance contracts. In Ukraine and Russia, the legal and accounting systems make it more problematic to collect a variable payment based on future performance. The problem in the former Soviet Union is not that the practice is prohibited. Rather, ESCOs fear that their contracts will not be upheld in court (making default easier) and customers fear that the tax inspectors may fine them for deducting costs for inappropriate contracts. Theoretically, these problems could be solved without new laws or regulations. In practice, though, legislation specifically allowing energy performance contracting would likely boost the industry.

The initiative and actions of individual ESCOs, likewise, cannot be ignored as a factor in promoting performance contracting. ESCOs with the right mix of expertise including finance, engineering, and project management, along with excellent customer service and a keen market sense are more likely to succeed than those that can only provide one piece of the puzzle. The numerous engineering companies throughout the region that would like to do energy performance contracting but cannot find financing are an example of this.

Thus, there is much that ESCOs themselves can do to improve their prospects. Many successful ESCOs have found that customer training is critical to helping clients understand the mechanisms and benefits of energy performance contracting. ESCOs can also seek partnerships to better attract financing and customers. For example, small engineering companies may provide in-depth knowledge of the local market, while larger foreign

companies may have access to financing and staff with expertise in finance and project implementation. Building partnerships to take advantage of such complimentary strengths can help new ESCOs provide the full range of services typically included in performance contracts.

Governments and public financing institutions can also take steps to improve the prospects for new energy service industries. In fact, the experience of the Czech Republic, Ukraine and Russia shows that public support can provide a critical boost for these industries. Three types of support seem to be particularly important:

- Strong legal basis for energy performance contracting;
- Training for engineering companies, banks, government officials and energy consumers; and
- Seed financing (including guarantees) to stimulate the market initially.

Developing a legal basis to support ESCO activities is virtually free for a government, though it does require forethought and political will. In the Czech Republic, for example, the Czech Energy Efficiency Center has successfully encouraged the Ministry of Finance to allow a slightly revised tender process for energy performance contracts. This simple change in rules can now open up the door to energy efficiency for thousands of government facilities throughout the country. Ukraine and Russia, on the other hand, may also need more basic legislation stating that energy performance contracts are legal and can be enforced even when the exact payment schedule cannot be determined in advance.

In some cases, government and state officials may need training in order to understand how energy performance contracts can be applied and how to organize tenders for them. Likewise, training has helped engineering companies in both the Czech Republic and Ukraine understand how to organize themselves as ESCOs and ultimately sign contracts with clients. Training can also help banks understand the value of energy efficiency and the benefits and risks of energy performance contracting, so they may be more willing to provide financing for such contracts.

While it does not make sense for public bodies to finance all ESCO projects in market economies, seed financing can play a major role in promoting energy performance contracting. The European Bank for Reconstruction and Development, for example, has set up numerous multi-project financing facilities with ESCOs so that these companies can provide financing for their customers. This has allowed these ESCOs to undertake more projects, and has ensured that they can use performance contracts with their customers rather than require traditional payment for services. The Czech Energy Agency's grants for energy efficiency projects also appear to have been an important factor in stimulating ESCO projects since most of the first such projects signed in the Czech Republic received a small subsidy from this agency. TACIS has played a similar role in Ukraine, though it has limited the grant availability to UkrEsco projects only. Such grants or subsidies can lower the cost of financing and convince customers to try out this unfamiliar mechanism.

Energy performance contracting holds great potential in countries in transition. It can help consumers reduce their energy burden and save money, yet without requiring them to use their limited cash resources for the initial investment. Beyond the individual benefits that ESCOs and their customers will reap, though, both the environment and the economies of countries in transition stand to gain from a growth in energy performance contracting.

References

Aslanian, Garegin. (Centre for Energy Policy). 2000. Personal communication to author. February 28 and March 31.

Aslanian, G. and S. Molodtsov. 1996. "Energy Efficiency Investment Financing as a Component of 'Synergy' Programme in Energy Policy in CIS Countries." In *Proceedings of the Energy Efficiency Workshop and Exhibition*. September. Cheliabinsk, Russia: International Energy Agency.

Baidakov, Vladimir. (Novosibirsk Energy Centre). 2000. Personal communication to author. February 25.

Business Central Europe Online (BCEO). 2000. *Business Central Europe Statistical Database*. At www.bcemag.com. Vienna: Business Central Europe.

Chandler, William. 2000. *Energy and Environment in the Transition Economies.* (in press) Boulder: Westview Press.

Diduskova, Martina. 1997. "Energy Performance Contracting in the Czech Republic." *News at SEVEn*. 11 (4), December.

Diduskova, Martina and Jaroslav Marousek. 1997. Energy Performance Contracting in the Czech Republic. Lecture for a seminar held September 25. Prague: Czech Energy Efficiency Center (SEVEn).

Energy Information Administration (EIA). 2000. *International Energy Information at a Glance.* At www.eia.doe.gov/emeu/international/contents.html. Washington, D.C.: Department of Energy.

International Energy Agency (IEA). 1999. *CO_2 Emissions from Fuel Combustion 1971-1997*. Paris: Organization for Economic Cooperation and Development.

Kochergin, Victor. (Energy and Resource Conservation). 2000. Personal communication to author. January 31 and February 16.

Kula, Borivoj. 1998. "Performance Contract[s] as a Service of the 21st Century and its Practical Application." In *Energy Efficiency Business Week Proceedings*. Prague: Czech Center for Energy Efficiency (SEVEn).

Marousek, Jaroslav. 1997. *Energy Services and EPC in the Czech Republic*. Prague: Czech Energy Efficiency Center (SEVEn).

Marousek, Jaroslav. (Czech Center for Energy Efficiency, SEVEn) 2000. Personal communication to author. January 20 and February 26.

Negawatt. 1998. "Negawatt Energy Service Company." At www.energy.ru/negawatt/index. Moscow: Center for Energy Policy.

Novak, Pavel. 1998. "What's Preventing the Development of EPC in the Czech Republic." In *Energy Efficiency Business Week Proceedings*. Prague: Czech Center for Energy Efficiency (SEVEn).

Novak, Pavel, Petr Knizek and Ivo Slavotinek (interview with). 1996. "The Future of EPC in the Czech Republic." *News at SEVEn*. 4 (4), October.

PCG. 1999. *About PCG*. Kyiv, Ukraine: PCG.

Raptsun, M, S. Surnin and P. Shestopal. 1999. "Perspectives and Barriers for Energy Efficiency Performance Contracting Implementation in Ukraine." *Building for the 21st Century: Energy and Environment. Proceedings of the 22nd Annual World Energy Engineering Congress.* October 20-22. Atlanta: Association of Energy Engineers.

Rosprom. 1996. *Proposal to Creation of ESCO Company 'Menatep-Rosprom-EBRD.'* Moscow: Rosprom.

Slavotinek, Ivo and Miroslav Votapek. 1998. "The Reality of EPC Services in the Czech Market." In *Energy Efficiency Business Week Proceedings*. Prague: Czech Energy Efficiency Center (SEVEn)

U.S. Department of Energy (DOE). 1999. *Richardson Announces DOE/UN Foundation Project. Will Improve Energy Efficiency, Reduce Energy Costs and Improve Care in Russian Hospitals.* Press Release on October 2. Washington, D.C.: U.S. Department of Energy.

Zeman, Jiri. (Czech Energy Efficiency Center, SEVEn) 2000. Personal communication to author. May 2.