**Energy Efficiency Service Market in the Czech Republic and Bulgaria**

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 **May 27, 2013**

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**Executive Summary**

Environmental threats and scarcity of energy resources have become major issues of the 21st century. Therefore, the call for energy efficiency emerged as a valuable solution to these challenges. With the popularization of the ideas of energy efficiency, a new market was formed- the market of energy efficiency services.

Nowadays, this market is recognized as a market with a significant environmental, economic and social role. That is why political will and support to the business environment of energy efficiency services are highly necessary.

The following report outlines the results from a theoretical research that has been conducted in order to compare the so called ESCO (business model of energy efficiency services) market in the Czech Republic and Bulgaria and give recommendations for the development of the market in Bulgaria, (representing an emerging market), based on the experience of the Czech Republic, (known as a leader of energy efficiency services in Central and Eastern Europe).

Based on literature review analysis, expert opinions and interviews, an extensive analysis of the ESCO market of both countries was made. Then after careful consideration of results and outlining main incentives, barriers and differences of both markets, important recommendations for the development of the market in Bulgaria were made.

The outcome of the research showed that the main challenges that Bulgaria needed to overcome in order to have a developed and well-functioning ESCO market were mainly related to political and economic issues, lack of knowledge, trust and experience in the matter. That is why, the creation of legal and economic stimuli and the implementation of various educational measures would have a beneficial effect, encouraging the development of the ESCO market in Bulgaria.

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 **List of Abbreviations**

EE Energy Efficiency

EEI Energy Efficiency Improvement

EEM Energy efficiency Measures

EES Energy Efficiency Services

ESCO Energy Service Companies

EPC Energy Performance Contract

ESC Energy Supply Contract

EEC European Economic Community

EEEF European Energy Efficiency Fund

EU European Union

# 1. Introduction

## 1.1 Background and Context

The rapidly growing population, the scarcity of energy resources, constant price rise in fuels and the environmental threats that society faces are among the main reasons for the call for alternative solutions in the field of energy. As a result, sustainable energy policies have become a priority for the world leaders nowadays.

The interest in sustainable energy is relatively recent. In the beginning and the middle of 20th century energy resources seemed to be sufficient and the idea of energy efficiency and conservation were not among the highly discussed issues. However, at the same time with the progress of technology, energy consumption was increasing more and more. This period was marked by the boom of electric appliances at home, the massive production in factories and the advances of transportation (Wulfinghoff, n.d.).

As a result, at the beginning of the 70s, the picture started to change. Leading oil producers declared limitations to petroleum resources, which led to higher fuel prices. Biggest petroleum consumers in the world such as US, Japan, and Western Europe faced for the first time the danger of not having enough fuel to satisfy their energy needs. The oil crisis was not a surprise for specialists in the area, however, for the mass of the population it was a completely new issue arising. That is why a change in attitude concerning this problem was needed and the idea of sustainable development became a topic of a great interest (Wulfinghoff, n.d.).

Many solutions applicable to these challenges have been developed in recent years. Energy efficiency services, that are becoming more and more popular nowadays, are considered to be among the most successful measures towards the reduction of energy consumption and the environmental footprint.

## 1.2 Goal

Energy services leading to energy efficiency improvement and especially the ESCO business model are recognized as an effective way to cope with the environmental challenges; reduce energy costs and stimulate economy. That is why supporting the growth of this market is essential. Many attempts for encouraging the business environment in this field are made both at European Union (EU) and national level. However, the market of these services in Europe is not evenly developed. There are countries whose ESCO markets are quite mature and well-functioning and countries where these markets are in an initial stage of development. It is very important for developing markets to make efforts for improvement and follow the example of advanced markets. Analysis of the markets, identifying existing barriers, outlining possible solutions and increasing the awareness of energy efficiency services are crucial for stimulating these services.

Thus, a theoretical research has been made to explore the development of the ESCO market in Bulgaria (one of the countries where the market is not developed enough) and the Czech Republic (a country considered a leader in this industry in Central and Eastern Europe). Therefore, the goal of this dissertation is to present the results from the comparison of the two markets and to give recommendations that could be applicable in Bulgaria, based on the experience of the Czech Republic.

## 1.3 Research Questions

To achieve the research goal, this report is going to answer one central question and several sub-questions. The central research question that this report is aiming to answer is: What good practices that facilitated the development of the ESCO market in the Czech Republic could be enabled in Bulgaria as well?

In order to give an answer to the main question and analyze in details both energy service markets, several sub-questions will be answered:

* What are the main differences in the development of the ESCO market in both the Czech Republic and Bulgaria?
* What are the existing incentives encouraging the ESCO market in both countries?
* What are the existing barriers in both markets?

## 1.4 Report Structure

In order to present the findings of the research in a logical and readable way, this report will follow the structure:

* Chapter 2 of the report will outline the methodology that has been applied in order to reach the results;
* Chapter 3 will provide general information which outlines the background in which ESCO services appeared,
* Chapter 4 will define the ESCO business model and the type of contracts used,
* Chapters 5 and 6 will be in the form of two case studies exploring the ESCO market in the Czech Republic and Bulgaria.
* Then there will be a conclusion giving answers to the three sub-questions.
* And in the end there will be a recommendations section which forms the answer to the central research question.

# 2. Methodology

In order to achieve the research goal, compare the energy efficiency service market in the Czech Republic and Bulgaria and give recommendations for Bulgaria, a qualitative research approach to the topic has been chosen. The aim of this approach is to interpret the existing information and provide conclusions based on verbal data analysis of both markets.

The first research method used was gathering and analyzing background information in literature resources such as articles, journals, reports from EU institutions, energy agencies and organizations and energy service companies, media articles and press releases. The aim of this method was to create a broader perspective into energy services and their application within the EU.

Another research method used to explore the market of energy efficiency services in the Czech Republic and Bulgaria was sampling two distinctive case studies. The main objective of this method was to narrow down the scope of the research, and provide an evidence of how theory worked in practice. In practice, both case studies provided valuable information of how developed is the ESCO market in both countries and the results were beneficial enough for making comparison and drawing conclusions.

Moreover, currently being an intern at an energy non-governmental organization, it gave me many opportunities to have discussions and carry out interviews with experts in the field. This research method was highly effective for developing the case studies as it provided expert and detailed information for both markets which difficultly could be found in literature resources.

After all data was gathered, then it was carefully analyzed in a qualitative manner which was highly useful to make conclusions based on patters and behaviors and give recommendations.

# 3. General Literature review

## 3.1 Sustainable Energy Policies in Europe and the Call for Energy Efficiency

It was in 1973 at a meeting of the heads of states of the European Economic Community (EEC) when for the first time environmental issues appeared on the policy agenda of the community. Initially, the reason was mostly related to the fact that there were too diverse environmental standards throughout the community which could lead to barriers to free trade. In 1986 when the Single European Act was signed, environmental policy appeared in the treaty text as a new policy area of the Community. Although it was a part of the political agenda, still environmental issues were considered among these that were not of major importance (Hildebrand, 1993).

The idea of sustainable development, however, does not only refer to environment but it is also a combination of social and economic issues, which altogether interact. The term was introduced for the first time in 1988 in European Council Conclusions. In 1997 with the Treaty of Amsterdam and reactions to the Kyoto Protocol, sustainable development became a legal objective under the treaties and subsequently with the Treaty of Lisbon it became one of the main EU priorities (Hildebrand, 1993).

Sustainable energy is one of the main branches of sustainable development policy of the Union, which is becoming more and more popular nowadays. One way to work towards the achievement of sustainable energy is to promote and apply different practices leading to energy efficiency improvement (EEI).

## 3.2 Energy Efficiency

Energy efficiency (EE) is one of the basic components of sustainable energy policy. The term energy efficiency implies the idea of reducing the amount of energy necessary for certain activity without worsening the quality. In other words: "using less energy to provide the same service”. There are many solutions that could be applied in order to achieve energy efficiency improvement (EEI) (such as: optimization of energy delivery, building insulation, replacement of appliances and devices with more efficient ones, etc.). These actions may be carried out by a variety of energy actors that apply energy efficiency measures (EEM) in buildings, industrial sector, lighting or transport sector (“What is Energy Efficiency”, n.d.).

Motivations for the need of energy efficiency solutions are various. First of all, by reduction of energy consumption there is a significant reduction of the energy costs. Moreover, it also leads to reduction of greenhouse gas emissions, other pollutions, and conservation of energy resources. Thus, the EU has recognized energy efficiency as one of the most practical ways to cope with the environmental threats (“Energy Efficiency”, n.d.).

As a result the so called Energy Service Directive was adopted in 2006. It is a legislative act that is fostering member states to initiate actions for stimulating the energy service market, as these services are seen as a key for the achievement of the EU’s energy and environmental goals (“Directive 2006/32/EC”, 2006).

In 2012 further actions were necessary and the Energy Efficiency Directive was adopted. According to directive 2012/27/EC from 2012:

The Union is facing unprecedented challenges resulting from increased dependence on energy imports and scarcity of energy resources, and the need to limit climate change and to overcome the economic crisis. Energy efficiency is a valuable mean to address those challenges. It improves the Union’s security of supply by reducing primary energy consumption and decreasing energy import. It helps to reduce greenhouse gas emissions in a cost-effective way and thereby to mitigate climate change (p.1).

The aim of this directive is to establish a common framework that promotes the idea of EE throughout the EU as a measure to achieve the Union’s 20% targets (20-20-20) on energy efficiency until 2020 (20% saved energy, 20% energy produced from renewable energy resources, 20% less greenhouse gas emissions). EE is seen as the fastest and cheapest way to overcome energy threats and to transform them into opportunities. Following energy efficiency strategy means not only achieving the “20% goals”, but also creating jobs, encouraging economy, and achieving technological development and advance. However, this practice is still not developed enough among all EU member states and there is still what to be achieved in this direction (“Energy 2020”, 2011).

# 4. The Nature of the ESCO Business Model

## 4.1 Energy Efficiency Services

Energy Efficiency Services (EES) are agreed actions between EES provider and a client, whose aim is to achieve energy efficiency improvement. The successful implementation of the EES leads to reduction in energy consumption and respectively reduction in energy costs, the amount of greenhouse gas emissions and other additional benefits such as increased comfort level and satisfaction; productivity and safety (Irrek, 2010).

## 4.2 ESCO Business Model

The ESCO business model is a distinct model of energy efficiency services. What distinguishes this model from other energy efficiency services is the contract-based model which involves complete, integrated, customer-tailored service.

ESCO providers are usually the so called ESCOs. These are organizations (private, public; public-private) that implement different EE actions in buildings, industry, transport or lightings.

According to the Changebest’s Energy Efficiency Service Development Guide, ESCO services are composed of three elements:

• Technology (solutions addressing different systems such as: “building structure; heating system; ventilation and cooling; lighting; electrical appliances; motor pumps; etc.”)

• Target group (different types of energy consumers: private households; commerce and services; industry; transport.)

• Value chain (the implementation of effective EES requires specific phases that need to be followed). Each phase represents a certain value provided to customers): “motivation; information; advice; planning; financing; installation; operation and optimization; monitoring of results” (Leutgöb, Irrek, Tepp, & J, 2011).

There are two major models and contract types considered ESCO: Energy Performance Contract (EPC) and Energy Supply Contract (ESC).

### 4.2.1 Energy Performance Contract -EPC

* EPC is a kind of agreement for energy efficiency services in which ESCOs give guarantees for the savings that will be achieved. The return on investment is directly related to the amount of energy saved. This means that after the project is realized, and measures leading to energy efficiency are applied, savings achieved are used to cover the funding of the project over a certain period of time agreed on the contract. The successful implementation of the project brings essential cuts in energy bills, reduction of greenhouse gas emissions, and increase in comfort. It is necessary to be mentioned that the EPC is the only type of energy efficiency service that gives specific guarantees for energy savings (Irrek, 2010).

The following figure gives an example of what kind of energy efficiency measures are usually applied to buildings in order to achieve a reduction in total energy consumption.



Figure 1: *Energy Efficiency Measures in Buildings, Source*: (“Fresh Project”,n.d.)

There are two ways of financing an EPC- by shared savings contract or guaranteed savings contract. Both contracts deal with the question: Who is responsible for financing the project?

* Shared savings contract- in this kind of agreement ESCOs finance projects usually by a third party financing. In other words, ESCOs take the financial risk. Then after the implementation of the project, the investment is covered by the difference in the energy bills during the contract period. Clients are only liable for providing monthly amounts equal to the energy bills that have been usually paid before. After the contract period is over clients can benefit from the energy savings. Therefore, the shared savings contract is quite a suitable measure towards improving energy efficiency in developing countries and economies as clients have no obligations in providing financing (Leutgöb, Irrek, Tepp, & J, 2011).



Figure 2: *Shared Savings Contract: Source*: (Auer, 2011)

* Guaranteed savings contract- in this kind of agreement clients are financed through banks, financial agencies, or own capital. In other words, clients take the financial risk and the ESCOs take the performance risk. Then clients’ financial obligations are repaid with the difference in the energy bills guaranteed by ESCOs. If this guaranteed difference is not sufficient to cover the debt, then ESCOs are obliged to cover it. However, this is a practice which could only function in well-developed countries having a strong bank system and awareness on these practices (Leutgöb, Irrek, Tepp, & J, 2011).



Figure 3: *Guaranteed Savings Contract*; Source: (Auer, 2011)

### 4.2.2 Energy Supply Contracting- ESC

ESC is another service considered ESCO. In this case, ESCOs offer a long-term contract for efficient supply of energy (heat, steam, cooling, and lighting) to clients through outsourcing their energy plant. In this agreement ESCOs take full responsibility to provide a package of services including: design and plan of the project, finance of the construction, purchase and delivery of fuel, operation, maintenance and energy management. ESCOs may realize energy efficiency measures in delivering the service, however, they do not take the risk in case energy efficiency is not improved, which is different from EPC. Clients are only responsible for making fixed payments during the contract period. This is another good practice thanks to which clients do not have to consider their energy supplies and can receive a quality, safe and energy efficient service (Irrek, 2010).

There are various ways through which an ESC project can be financed. The most typical way for financing is when ESCOs provide finance for the investment. Then the investment will be returned during the period of the contract. Usually the length of these contracts is about 10 to 15 years.

The main objective of the ESC contracts is for customers to lower their energy costs. There is no direct energy efficiency concern. However, most ESCOs providing ESC are constantly working towards the most energy efficient technology and equipment, as it is in their interest to provide efficient energy and respectively the cheapest energy supply (Irrek, 2010).

Both forms of contract agreements are considered to be quite innovative business models. Having in mind the fact that the return on investment for ESCOs is directly linked with the quality of the implemented projects, this means that they are urged to provide the best service and quality. That is why these services are recognized as a driving force for the reduction of energy consumption and greenhouse gas emissions.

The following figure provides an example of how energy supply contract can be used in a building in order to deliver efficient energy from solar panels. In such case ESCOs build solar installations and take care of the whole energy management process, measurement and verification in order to sustain a certain energy standards.



Figure 4: *Example of Energy Supply Contracting*; Source: (Mahoney, 2009)

## 4.3 EU’s Stimuli for the development of ESCO market throughout Europe

In order to stimulate and assist member states in implementing EEM for increasing energy efficiency and respectively contribute to the achievement of EU energy efficiency goals, the Union is paying a special attention on the ESCO market and it is providing different financial stimuli for encouraging the market growth. For instance, European Energy Efficiency Fund (EEEF) was created in July 2011, with a volume of EUR 265 million, providing funding to public authorities or private organization for implementing energy efficiency projects (“Financing Energy Efficiency”, n.d.).

Other examples for supporting the development of ESCO markets among member states are the various EU operational programmes and initiatives. The aim of these programmes is to facilitate organizations implementing projects in the field of sustainable energy. They establish better conditions for carrying out projects related to renewable energy, energy efficiency (in buildings, industrial sector, consumer products and transport) by removing existing market barriers, ensuring better business environment, and creating awareness on EU energy policies among MS (“IEE Programme”, n.d.).

## 4.4 Brief look at the ESCO Market in Europe

As mentioned before in this report ESCO services are seen as an effective solution to achieving EEI. In order to foster the development of the ESCO business models, a well-functioning ESCO market is needed. The ESCO market has started its development in 1980s and 1990s as a reaction to new energy prices and environmental trends. However, it has not reached its full potential yet. In Europe the ESCO market is quite diverse and the number of these companies varies from country to country. Some companies are operating only locally, while others are providing services at international level. With the enlargement of the EU the ESCO market have become even more diverse. In this market there could be distinguished several groups of countries with similar characteristics of the ESCO market:

* Germany, France and UK could be pointed as leaders in this field with the largest market share on the ESCO market.
* New successful and fast growing markets are Austria and the Czech Republic
* Denmark, the Netherlands and Lithuania are known as countries where energy efficiency is a priority; however ESCO business model is not among the main practices used there.
* Greece, Poland, Portugal, Ireland, Malta, Cyprus, Romania, and Bulgaria are countries where energy efficiency has become a priority quite recently and there have not been achieved a lot in this respect. However, those countries are seen as markets with a great potential for future enlargement and development.
* Sweden, Slovakia and Estonia have failed to develop an ESCO market as a consequence of mistrust of this practice (Lamers, Kuhn, & Krechting, 2008).

# 5. Case Study 1: The ESCO Market in Czech Republic

## 5.1 PESTEL Analysis

The following analysis aims to explore the macro-environmental factors that influence the ESCO business environment in the Czech Republic. This strategic tool gives a deeper understanding of market processes and could be highly beneficial for making evaluations of the market.

### 5.1.1 Political

Major goals of the Czech Republic regarding its energy policy became the liberalization of the electricity and gas markets, energy supply security, energy efficiency improvement, sustainable use of energy resources, and reducing the environmental impact. The Czech Republic instituted many reforms in the energy sector, building labialized and open to competition market.

In this respect, several important political measures were taken for facilitating energy efficiency and reducing environmental impact. Joining the EU in 2004 the energy policy of the country was synchronized with the EU, engaging with the obligation to follow EU energy goals and policies. Many legislative acts have been adopted. Essential role in this policy has the Czech Ministry of Industry and Trade which supports energy efficiency measures together with the agency Czechinvest. It is another body that has the same energy efficiency objectives and initiates financial stimuli such as the Operational Programme Enterprise and Innovation. The State Environmental Fund is an organization under the Ministry of Environment which offers other incentives such as the Operational Programme Environment and Green to Savings programme which provides loans and subsidies. Moreover, the EFEKT programme was created as an initiative of the Czech government. It implements free of charge educational and raising awareness measures to society on energy efficiency and renewable energy resources. Energy Consulting and Information Centre was also established to implement similar soft measures (“Energy Efficiency Profile: Czech Republic”, 2012).

In other words, the Czech Republic’s energy policy as a whole is relatively favorable in relation to the ESCO market. Liberalized market and political incentives towards energy efficiency are the base for a well-functioning energy efficiency market. However, specialists in the area still believe that these political actions have more indirect effect on the market, than direct (Energy Efficiency Profile: Czech Republic, 2012).

### 5.1.2 Economic

The Czech Republic is considered a stable and prosperous market economy with a relatively healthy financial system. The economy of the Czech Republic is mainly orientated towards exports, especially to Germany and still stays sensitive to economic changes in other markets. The largest industry of the Czech Republic is the automobile sector which represents about 24% of the Czech manufacturing. The GDP of the country is $ 220.3 billion (2011). It is marked by a growth compared to previous years (1.8%). About 9 % of the population is below the poverty line and 58.3 % is employed in the service sector; 38.6 % in the industry sector and 3.1% in the agriculture. The unemployment rate is 8.5% (2011) which is relatively lower than in previous years (“Czech Republic Economy Profile”, 2013).

In relation to energy, the Czech Republic is a producer of solid fuels and nuclear energy and has limited its imports in the form of gas and oil from Russia. The energy consumptions and levels of CO2 are considered relatively high in comparison with other EU states in the last five years. The total year electricity consumption of the country is estimated to be around 59.26 billion kW (2010), which is higher in comparison with the average of the Union. The Czech Republic exports yearly 59,2 billion kWh and imports 6.6 billion kWh. The electricity price in households is also relatively high: EUR 0,15 per KWh and EUR 0,099 for industrial consumers (“Europe’s Energy portal”, n.d.). The major energy resources used are coal and lignite about 60% (2009) which still result in large amounts of CO2 (largest in the EU), although it is declining compared to 1990s when it was about 75%. Instead, nuclear power percentage is increasing from 20 % in 2000 to 33 % in 2009 (“Czech Republic Electricity – consumption”, n.d.).

Reforms for improving the environmental conditions and energy savings have been initiated since 1990, including encouragement of the ESCO industry. Factors such as the stable economy and financial system of the Czech Republic, the relatively high energy prices, and the demand for lowering the CO2 emissions are preconditions for better business environment for the development of ESCO market.

### 5.1.3 Social

The Czech Republic, being situated at Central-East Europe, could be described as country with prosperous society and rich culture shaped by different cultural influences throughout years. Due to the political changes in the end of the 20th century, Czech society has become highly consumerist. In recent years the average household expenditure has increased to a large extent, especially in relation to water and energy consumption, which causes serious environmental hazards. As a result, society is becoming more and more familiar with environmental trends and in this respect ESCO practices are also gaining popularity.

### 5.1.4 Technological

Czech government has always supported the country’s research and development activities. Since the Czech Republic has become a member of the EU, it participated actively in various programmers and initiatives supporting technological and scientific development. Historically, in technological aspect the Czech Republic has been following the highly technology developed countries such as Germany, Austria. It could be said that the Czech Republic is showing quite good results in engineering and energy industry. Therefore, there are plenty of technological solutions available (“Science and Technology in the Czech Republic”, 2012).

### 5.1.5 Environmental

The main environmental problems that exist in the Czech Republic are related to air, water and land pollution. The reasons for this pollution are: industrial activity and economy marked by high energy intensity; agriculture and mining. In 1990s, the Czech Republic had the highest rates of CO2 in the world, mainly due to the usage of lignite as an energy resource. Although it has been reduced in recent years, there is still what to be achieved in environmental aspect. Many policies, plans, programmes have been issued in order to cope with this problem. Energy efficiency targets are also among these solutions that could cause decrease in the environmental impact and climate change (“Energy Efficiency Profile: Czech Republic”, 2012).

### 5.1.6 Legal

In legal aspect there are plenty of initiatives taken from the Czech Government in order to support the realization of energy and environmental goals. Energy Management Act was adopted firstly in the year 2000 and was amended in 2006 and then in 2010. This piece of legislation set a minimum requirement for energy demand, energy audits, and labeling of energy appliances. In 2004 the State Energy Policy was adopted in which the energy and environmental targets until 2030 were outlined. Furthermore, in 2007 the Czech National Energy Efficiency Action Plan was issued. This plan set clear goals that energy savings of at least 9 % had to be achieved until 2016. In 2010 a Strategic Framework for sustainable development in the Czech Republic was adopted whose aim was to promote and facilitate the future sustainable development of the country. In June 2011 The Second National Energy Efficiency Action Plan was adopted. The plan included extensive analysis and evaluation of the previous one. It discussed what had been achieved, what were the results, what still needed to be achieved and what other measures should be implemented in order to be achieved the EU energy goals. Third National Action plan is going to be presented in 2014 focusing on future development of the energy policy of the country (Spitz, 2012).

The PESTEL analysis that has been presented above gives an insight about the context in which ESCO market functions in the Czech Republic. Based on the analysis we can make the conclusion that the overall external factors have relatively beneficial effect on the ESCO industry. The main drivers of the ESCO market are the high energy prices and the need for reduction of the environmental footprint. Moreover, the ESCO market in the Czech Republic exists in a well-functioning economy with a liberalized energy market, and general political support to energy efficiency. These are important preconditions for the existence of an advanced ESCO industry.

## 5.2 Overall Description of the Czech market

The Czech Republic is one of the first countries in Europe where the ESCO model was introduced. The ESCO market in the Czech Republic can be described as moderately developed and it is predicted that the boom is still to be coming. In comparison with other countries in Eastern Europe the Czech Republic is considered a frontrunner in the ESCO industry.

The EPC business model was introduced there for the first time in 1993-4 when a 3 million investment was made to improve energy efficiency in healthcare sector. The reconstruction of Balovka Hospital was the first EPC project carried out in the Czech Republic and in Europe at all. As a result, energy savings of about 43 % were realized only after the first year. Significant contribution for the project had the Energy Efficiency Centre SEVEn and especially Ivo Slavotinec (Hansen, Langlois, & Bertoldi, 2009).

During the next 5-6 years there was a slowdown in the implementation of ESCO projects, as a result of existing barriers and lack of awareness. At that time an important factor that led to the market growth was the training of ESCO companies which was held in 1994. It was initiated and financed by the Phare programme. Until the end of 1996 approximately 20 ESCOs went through the training courses and about half of these companies included the EPC model into their services. The Czech Energy Agency also played a key role in the development of the ESCO market and supported the provision of subsidies (Marino, Bertoldi, & Rezessy, 2010).

After the year 2000 many legislative acts were adopted which were additionally stimulating the energy efficiency services. The Ministry of Finance adapted the EPC model as a form of supplier credit. As a result, there was a considerable growth in ESCO projects at that time. A key role in that had also measures such as: compulsory energy audits and energy efficiency measures for large energy consumers; the availability of subsidies for energy savings; tax exemptions, and energy labeling.

Currently, according to Jana Szomolányiová, senior consultant at SEVEn, the Czech Energy Efficiency Centre, in the Czech Republic there are about 50 ESCOs providing EES and especially EPC as a core activity such as: ENESA; AB Facility; SUE etc. In addition there are several hundreds of companies providing ESC. In this case the ESCO outsources, manages the energy equipment and delivers energy (in most cases heating), at a fixed price agreed on the contract. Usually these energy providers do not keep track on the energy savings, although they are guaranteeing some. Among companies providing ESC are: MVV (the first ESCO company in the Czech republic founded in 1993 in Prague, initially offering only EPC) Energie, Dalkia, and ITES, which offer EPC as well. There are also a couple of other companies which provide some kind of energy efficiency services such as facility management and supply of energetically economical facilities (SIEMENS) (Szomolányiová, 2013).

ENESA established in 2005 is considered the ESCO market leader in the Czech Republic. The managers and the owner have had experience with EPC since 1993 when they have realized the first project in the country. The company targets both public and private sector. During the recent years, the company has become one of the most successful ESCOs implementing the majority of projects in the country, including the National Theatre in Prague. In addition, the company is a part of the so called working group of ESCOs, operating under the Czech Chamber of Commerce, which has the opportunity to influence the business environment. Therefore, main drivers of the market are considered the ESCOs, not the authorities (Sochor & Szomolányiová, 2009)**.**

Until recently about hundreds of EPC projects have been realized in the Czech Republic and the total size of the market is estimated to be around 8 million EUR. This amount includes only the EPC market size. If ESC projects were included the amount would be much higher. However, these types of contracts normally do not focus on energy savings and that is the reason why their value is not included in ESCO market size.

The type of financing of EES depends on the type of projects. The most commonly used contract type is guaranteed savings contract model, according to which the financing comes from clients (either borrowed or own capital). These arrangements are normally used when the investment is too high and exceeds the loan possibilities of ESCOs (Sochor & Szomolányiová, 2009)**.**

## 5.3 Target Group

The main target group of ESCO services in the Czech Republic is the public sector including both municipality and state-owned facilities. According to information provided by the Joint Research Centre, the projects implemented within the public sector account for about 80% of all projects implemented. This includes projects implemented in public administrative buildings, schools, health buildings, universities etc. However, in this sector municipalities are seen to be the ones where ESCO projects are easier to be realized as barriers are less. In this case, the spending on investment and the energy savings are on the same budget, which makes the compensation of ESCOs easier. In contrast, when the building is state-owned, then usually energy savings are transferred directly to the owner which makes the process more complicated (“Energy Service Company Market in Europe”, 2010).

In order to reduce barriers of these kinds The Czech Chamber of Commerce created ESCO working group whose aim was to facilitate the process of energy services within the public sector. Moreover, ESCO companies have established an informal association, through which they could initiate new rules and regulations for further development of the public sector as a target. Thus, it is considered that the advance of the ESCO market in the Czech Republic comes mainly from ESCOs’ efforts than from the government.

Industrial sector represents another major target group of the ESCO providers. The Czech Republic with its industrial activities is considered to be one of the EU member states with highest greenhouse gas emissions and energy intensity. Therefore, energy efficiency measures in industrial sector are quite necessary in order to overcome this problem. According to experts, the industrial sector in the Czech Republic is well-developed and barriers for ESCO services are smaller. Industry in the Czech Republic accounts to a significant part of the Czech GDP and enterprises can rely on own capital or banks loans for financing the project. There are examples of projects already implemented in chemistry; processing industry; bakeries etc. The Operational Programme Enterprise and Innovation and The State Programmes in Support of Energy Savings and the Usage of Renewable Energy Resources, are designed to provide financial support for ESCO projects in the industry sector (Sochor & Szomolányiová, 2009)**.**

The residential sector target group is not as developed as other sectors. However, attempts are made for enabling more projects. There are several operational programmes which provide subsidies for the implementation of ESCO projects in the sector such as “The Green to Savings Programme”. The programme is established for family house owners. It is the largest funding programme in the Czech Republic and is being financed by the State Housing Fund. Moreover, according to the law, there are tax exemptions for buildings where energy efficiency measures are implemented or renewable energy resources are used (Sochor & Szomolányiová, 2009)**.**

## 5.4 ESCO Business Model in the Czech Republic

In the following section the nine building blocks business model canvas is used in order to present a systematized overview of the features of the ESCO business model existing within the Czech Republic.

**Customer Segments**

Public Sector

* Municipality-owned buildings
* State-owned buildings

Private

* Industry
* Residential

**Customer Relationship**

Dedicated customer assistance +post service assistance

Creating sustainable image by indirect relationship with partners

**Channels**

Direct Distribution

**Key Partners**

Suppliers

ESCO agencies

NGOs

Governmental Institutions

ESCO funds

Informal Working Groups

EU ESCO agencies and bodies

**Value proposition**

* EPC

Integrated, customer- tailored service leading to energy consumption reduction; energy cost reduction; CO2 emissions reduction; increased comfort; satisfaction and productivity (for industrial sector)

* ESC

Integrated, customer- tailored service for efficient and safe supply of energy.

**Key Activities**

Energy audit

Identification of measures

Technical planning

Implementation

Maintenance

Measuring results

**Key Resources**

Human; Financial; Technological

v

**Cost Structure- Value driven**

Raw materials Equipment Energy Purchase

 Human resources Logistics Marketing

**Revenue Stream**

EPC- revenue based in most cases on the guaranteed-savings contract model (customer is responsible for the investment of the project)

ESC- revenue which comes from the monthly fee for energy delivery agreed on the contract

Table 1: *The ESCO Business Model in the Czech Republic* (“The Business Model Canvas”, n.d.)

Looking at the ESCO business model of the Czech Republic, it can be concluded that the value offered and the key activities that lead to that value are not different from the typical ESCO model. All energy efficiency measures listed on the table interact together in order to create the value proposed. Through applying measures such as auditing, planning, EE measures, monitoring and maintenance, customer benefit from energy cost reduction, reduction of the environmental footprint; increased comfort and satisfaction.

Considering the information presented in the target group section we can identify two main target groups- public and private sector. However, because of their features, these target groups could be divided by two more segments which have more similar characteristics and requirements. Public sector could be divided by municipality and state-owned buildings as the management of the two segments is different and, therefore requires different procedures and public procurements when starting an ESCO projects. The private sector can also be divided by two segments- industrial and residential, again because the two segments have different characteristics and demands, and different solutions need to be applied.

The main partners of ESCO companies in the Czech Republic are these who are supporters of the idea of energy efficiency. In the Czech Republic there are many agencies, NGOs, governmental bodies, ESCO funds, EU bodies that are all fostering legislation and incentives in favor of the ESCO business model development. Therefore, these are considered the main partners of ESCOs. Suppliers also have an important role in the whole process. That is why, partnership with suppliers is also essential.

Key Resources necessary for the implementation of a successful ESCO project are human resources (representing qualified work force), technological (engineering solutions for achieving energy efficiency improvement), equipment and financial resources.

In order to attract customers the ESCO business model in the Czech Republic offers dedicated customer assistance, including post service assistance. Every project is designed according to the specific requirements of customers and the specific features of the site. Then after the project is realized, results are carefully monitored and if necessary maintenance is provided. Moreover, by its partnerships with NGOs, governmental and EU structures supporting the energy efficiency ideas, ESCO companies create sustainable image, which customers also find attractive.

The ESCO service is directly distributed to customers. No intermediaries are used. The ESCO communicates directly with customers and tailors the service individually to each customer.

The main costs existing within ESCO companies are related to the purchase of raw materials, purchase or production of equipments; in the case of ESC- energy purchase. Moreover, costs for logistics, human resources and marketing are also present.

The revenue that ESCOs realize after the project is implemented comes directly from customers’ payment (as in the Czech Republic the main contract agreement used is the guaranteed saving contract- investment of the project comes from customers). In few cases, mainly within the public sector, ESCOs finance the project and then, the return on investment comes from the energy savings that customers realize (shared-saving contract). In the case of ESC the return on investment comes from regular fee from customers agreed on the contract over a certain period of time.

## 5.5 The Five Forces of Porter

 

Figure 3: *The Five Forces of Porter; Source*: (Porter’s Five Forces Model, 2009)

In the following section another analysis tool will be used. In this case the market will be analyzed from another perspective. The Five Forces of Porter model will be applied. The aim of this analysis is to evaluate the intensity of the 5 competitive forces and determine the attractiveness of the market and the potential for new comers to enter the market (“Porter’s Five Forces Model”, 2009).

### 5.5.1 Threat of new entrants- High

The Czech ESCO market is estimated to be moderately developed. There are not any licenses necessary for ESCOs to perform EE services. The access to distribution is easy; therefore it cannot be considered a threat to new entrants. Main barriers are related to the lack of knowledge and experience in the matter. In order to perform quality energy services, companies need to have technological and engineering know-how. However, not every engineering company that provides similar services can provide the savings guarantees that ESCOs can offer. Furthermore, in order to undertake a project through a public procurement (in the public sector), companies are required to already have some experience with implemented projects which makes it hard for new players to enter the market (Sochor & Szomolányiová, 2009)**.**

In addition, on the ESCO market there are ESCOs operating since the 90s with a significant share of the market. These companies are well-known and have already built an image. Therefore, there is a strong competition and for a newly established company it would not be easy to gain customers and start working on projects.

Anyway, the boom in ESCO services it predicted to come in the next few years. There is still a potential for new players having in mind that sectors such as the residential and to some extend the industrial are not developed enough yet. This means that the market could be attractive for ESCOs targeting undeveloped segments and which are offering innovative solutions with higher value.

### 5.5.2 Threat of substitutes-Middle

In the Czech Republic there are various companies that offer different kinds of EE services. However, only ESCOs provide services which give specific guarantees for the results. In this case, the threat of substitutes exists when clients decide not to use exactly this business model and implement energy efficiency measures provided by substitute companies. But these companies do not provide guarantees for the result and thus, the quality is questioned. These substitute companies could also offer partial service, which is only a part of the integrated ESCO service, for instance, only building insulation or appliances replacement.

In the Czech Republic, companies that are offering substitute services are mainly companies distributing gas or electricity (Dalkia, Energie, MVV, ITES), companies assembling energy equipment and energetically economic facilities (SIEMENS, Johnson Controls), companies delivering energy by operating their clients’ energy equipment (MARTIA, EVČ), energy investment and consulting companies (Sochor & Szomolányiová, 2009)**.**

Applying fragmented services is cheaper, but it does not provide sufficient motivation for contractors to improve quality and reduce costs, so they would result in a lower customer value. Moreover, energy services in the Czech Republic are gaining popularity and when it comes to energy efficiency, clients usually tend to select the integrated service. Thus, the threat of substitutes can be considered middle.

### 5.5.3 Power of buyer-High

The Czech Republic is a country where the ESCO services are known for about 20 years. The market is estimated to be developed and stable. These services are becoming more and more trusted and valued. The number of ESCOs operating on the market is also considerable and is constantly growing. Customers in the Czech Republic nowadays have an access to information, variety of solutions and companies from which that they can choose. In this respect, they are becoming more demanding and consequently, the competition on the market is growing. ESCO services are expensive investments; therefore the customer price-sensitivity factor is essential. The contract type and conditions under which projects are initiated are also crucial for the choice of the customer. That is why, it is not surprising that the power of buyer and his ability to put pressure on ESCOs is high.

### 5.5.4 Power of supplier-Middle

Suppliers of ESCO companies are usually companies manufacturing building materials, windows and glass units, insulation, electricity efficient appliances, lighting and other manufacturers of technical and engineering equipment (such as SIEMENS and Johnsons Control). It becomes clear that at a certain point suppliers are also these that can provide substitute services and be partners and competitors at the same time, depending on which perspective we are looking on them. That is why in order to limit threats of competition from suppliers most of the bigger ESCO companies started manufacturing themselves equipment and facilities.

 Although suppliers in some cases could also be competitors, on the raw materials market there are many technologies and solutions available. The competition between suppliers is intensive. So in this respect, it can be concluded that the power of suppliers is middle.

### 5.5.5 Competitive rivalry- High

The Czech ESCO market is a developed market existing since the 90s. The number of ESCOs and projects implemented is not small. There are many companies and energy efficiency solutions on the market. These services require significant investment on behalf of the customer. Therefore, customers are price-sensitive and have higher demands. For newly established companies it is also not easy to enter and stay on the market. That is why, it can be concluded that there is an intensive competition between existing ESCOs, which are always trying to gain a competitive advantage over competitors.

In conclusion, based on the Five Forces of Porter analysis it can be said that the ESCO market in the Czech Republic is one of those relatively well functioning markets in Europe. The market can be described as a market with intense competition and certain barriers to new entrant. In this respect the market is not as attractive as other markets being in initial stage.

## 5.6 Still Existing Barriers

Although the ESCO market in the Czech Republic is relatively well-developed and well-functioning, there are still some barriers that prevent the market from further growing. The following section will examine the existing barriers that are considered threats to the market growth.

* Lack of know-how and experience: In order to start offering ESCO services a company is required to have available specific technological and engineering solutions. Know-how and experience in the field are highly necessary. Not every company operating on the EE services market has the technological capacity to realize projects with the quality and effect of ESCOs. Therefore, the lack of experience and know-haw are considered to be a serious barrier to the further enlargement of the market.
* Administrative barriers: Administrative barriers are among the main reasons for hindering the development of the ESCO market in the Czech Republic. As already mentioned in this report, the complicated management structure within the public sector causes serious difficulties for the implementation of ESCO projects. Often manages do not have an access to the energy savings as they are directly transferred to owners. Moreover, there are many unclear and complex rules and legislation which create additional constrains as special conditions and requirements are not outlined. And last but not least, there is not enough motivation and knowledge among public sector employees to undertake the complicated EPC contracts and procedures.
* Financial barriers: Financial barriers are as well a significant factor that creates obstacles for the development of the ESCO market. Financial crisis is seen as a major threat for the growth of the market. As a result, many companies are facing difficulties in finding financing. Furthermore, for clients within the public sector that are in a situation of indebtedness, it becomes impossible to obtain financing. Another barrier is that there are projects that have longer payback period which sometimes makes the implementation of the project unattractive. They are seen as highly risky as ESCOs do not have any guarantees for the solvency of their clients. Thus, usually ESCO are not willing to invest in too long-term projects.
* Lack of awareness: Although the ESCO industry in the Czech Republic is considered to be well-developed, still a lack of awareness has been identified as another significant barrier that limits the number of ESCO projects. There are prejudices towards the complicated contracts and procedures. Many are not well informed about the benefits and stay skeptical about this kind of investments (Sochor & Szomolányiová, 2009)**.**

## 5.8 Conclusion

In conclusion based on the analysis above and the information presented it can be said the Czech Republic can be described as a country with stable political system, liberalized energy market, prosperous society and need for energy efficiency regarding the environmental challenges. Having in mind this context it is not surprising that the Czech Republic is a country with well-developed ESCO market that has appeared in the 90s. There is a large number of ESCOs that are facing relatively beneficial political and legal incentives. However, ESCOs themselves, together with other agencies, NGOs and governmental bodies are the main drivers of the market. The market is characterized by intense competition, mainly in the public sector. Although the ESCO market is developed, still there are some barriers such as administrative barriers; lack of experience and know-how, financial difficulties due to the financial crisis and lack of awareness.

# 6. The ESCO market in Bulgaria

The following case study is going to explore the ESCO market in Bulgaria, one of the countries where the market is in initial stage and there are many obstacles for further development. Via analyzing the energy service market in Bulgaria, the main differences between the ESCO markets in the Czech Republic and Bulgaria could be identified.

## 6.1. PESTEL Analysis

The following analysis will be used to explore the context in which the ESCO market in Bulgaria exists.

### 6.1.1 Political

Being a member of the EU since 2007, Bulgaria is working towards the harmonization of its energy policy with the EU. In this respect, Bulgaria has adopted different pieces of legislation in order to create incentives for the ESCO market. By adopting the Energy Efficiency Law, the country sets its energy targets that need to be achieved until 2016 mainly via proposing measures related to energy consumers. Based on the Energy Efficiency Law, Energy Efficiency and Renewable Resources Fund was established, in order to support energy efficiency and renewable energy projects, mainly by providing financial guarantees and low interest loans. Sustainable Energy Development Agency was also established; whose aim was to assist the state activities towards the promotion of sustainable energy, monitor and control results (“Bulgaria Energy Efficiency Report”, 2011).

 Although there are obvious efforts made for fulfilling EU requirements and turning energy efficiency into a national priority, there is still what to be achieved in this direction. The energy market in Bulgaria has been liberalized since 2007. However, in practice it is not working the way it has to. There is an informal monopoly of the energy supply and customers do not really have the possibility to choose a supplier. In this case, the monopolist is interested in increased energy consumption. That is why monopolists are also seen to be a barrier to energy efficiency and respectively to ESCOs.

Moreover, regarding the sustainable development, Bulgarian government is giving a higher priority to energy produced from renewable energy resources instead of to energy efficiency. This can also be considered a reason for the slowing the development of the ESCO market.

### 6.1.2 Economic

Bulgaria is a country with industrialized market economy. The total GDP of the country is estimated to be $ 101 billion (2011) and the service sector accounts for about 80% of it. A modest growth by 1.7% in the GDP was observed in the last few years. During the last years the country showed relatively good financial discipline with the lowest public debt, and budget deficit in the South-East Europe. Leading sectors of economy are agriculture, tourism, and mining of coal, copper and zinc. The encouragement of foreign trade, investments and entrepreneurial activities in recent year has become a major policy goal. Although the economy of Bulgaria is marked by a slight growth since 2000, it is still the poorest country in the EU. The unemployment rate is 9.6% (2011). The weak judicial system and corruption are the main factors for hindering the economic growth and development (“Bulgaria”, n.d.).

Bulgaria is a country with a well-developed energy sector which is a key driver of economy. The sector is mainly composed of energy generation and oil and gas transit to European markets. Bulgaria is a highly dependent country regarding its energy supplies such as Russian gas and oil. The biggest energy producers in the country are the Nuclear Power Plant, major Thermal Power Plants, and Hydropower plants. The total electricity consumption is estimated to be about 28.3 billion kWh (2009) with the lowest electricity prices across EU in households -EUR 0,084 per KWh and EUR 0,063 (2012) in industry (Europe’s Energy portal, n.d.). The largest energy consumer is the industrial sector, which is marked by high energy intensity rates and contributes for large amounts of greenhouse gas emissions (“Energy Efficiency Profile: Bulgaria”, 2012).

Having in mind this information, it can be said that essential factors hindering the ESCO market in Bulgaria are the low energy prices, which do not really motivate consumers to undertake energy efficiency measures. Moreover, weak economy and the economic crisis impacts are also serious barriers to ESCO market in Bulgaria by limiting the financial resources for EE projects. Investments from the public budget on energy efficiency are highly restricted and related to administrative burdens and complicated procedures. Funding through bank loans is hard because this kind of investment is seen quite risky. The interest rates are very high and this makes the reimbursement of project difficult. The Energy Efficiency and Renewable Energy Fund, however, is a financial institution which provides loans with lower interest rates and portfolio guarantees for ESCOs. Thanks to this fund many of the energy efficiency projects in Bulgaria have been financed. This fund can be considered one of the main drivers of the ESCO market in Bulgaria (Nikolaev, 2009).

### 6.1.3 Social

Bulgarians could be described as individualistic and conservative nation. They do not accept easily new trends and changes. Therefore, the ESCO model, being introduced not long ago in Bulgaria is still distant and mistrusted. Furthermore, during the socialist period energy prices were extremely low and the idea of energy conservation was quite distant for society. For the same reason environmental issues are not as popular as they are in other EU countries. Raising awareness, education, dissemination of information and demonstration of good practices are necessary in order to increase trust and limit barriers at social level. Currently, the picture is changing and there is a great demand for energy efficiency. It is expected that by applying these measures, the population will become more environmentally and energy savings conscious, which would lead to popularization of ESCO services.

### 6.1.4 Technological

Nowadays, with the globalization processes energy technologies have become available to a large extent. Although Bulgaria is behind in developing technologies in comparison with other EU countries and the Czech Republic, it has an access to a large variety of technological solutions in the field of energy. Moreover, most of the ESCOs operating in Bulgaria are specialists in equipment manufacturing which makes it easier for them to apply energy efficiency solutions.

### 6.1.5 Environmental

As a result of the heavy industry and intensive agriculture during the socialist period, Bulgaria suffers from land and water pollution and forest diminishing. The rapid growing of motor vehicles since 1990 and energy production account for a large amount of air pollution. Air pollution is one of the biggest environmental problems in the country. In recent years many attempts are made in order to limit pollution. The Energy sector in Bulgaria accounts for a significant rate of the greenhouse gas emissions. Thus, energy efficiency measures are becoming more and more popular in Bulgaria and are seen as a major solution for the reduction of CO2 emissions (“Environment of Bulgaria”, n.d.).

### 6.1.6 Legal

In legal aspect towards the development of Energy Efficiency several incentives were created for stimulating the ESCO market. Firstly, in 2004 Energy Efficiency Law has been adopted by government. The aim of this law is to define the concept of energy efficiency in terms of being a national priority; to define stakeholders and determine their roles. Another legal action that Bulgaria took is the National Long-Term Programme for Promotion of Renewable Energy 2005-2015. Based on Directive 2006/32/EC, the National Action Plan for Energy Efficiency 2008-2010 was adopted, which set targets for energy savings of at least 9 % until 2016. In 2012 the Second National Action Plan for Energy Efficiency 2011-2013 has been adopted, which is now functioning as the only energy efficiency strategy of the country. The plan contains analysis of the results from the adoption of the previous plan and outlines additional measures that need to be achieved. The third Action Plan is planned for 2014 (Energy Efficiency Profile: Bulgaria, 2012).

According to experts in the sphere, the EE legislation in Bulgaria, compared to other EU member states is relatively good. Potential problems are related to administrative burdens such as clumsy bureaucratic system and complicated procedures.

The following table compares the information from the PESTEL analysis of the Czech Republic and Bulgaria. The table clearly shows the main differences in the macroeconomic context in both countries, which have an impact on the overall development of the ESCO market.

|  |  |  |
| --- | --- | --- |
| **PESTEL** | **Czech Republic** | **Bulgaria** |
| **Political** | * National Energy Policy harmonized with the EU
* EE has become a national priority.
* Liberalized and well-functioning energy market
* Stable political system.
 | * National Energy Policy harmonized with the EU
* Energy from renewable resources has a higher priority than EE
* Monopoly in energy supply
* Weak judicial system and corruption
 |
| **Economic** | * Prosperous market economy with a stable financial system
* Access to capital
* GDP $ 220,3 billion
* Total electricity consumption- 56,2 billion KWh
* Electricity price (households)- EUR 0,15 per KWh
* Electricity price (industry)- EUR 0,09
 | * Weak economy and financial system
* Difficult access to capital
* Very high interest rates in banks
* GDP $ 101 billion
* Total electricity consumption- 28,3 billion KWh
* Electricity price (households)- EUR -0,06 per KWh
* Electricity price (industry)- EUR 0,08
 |
| **Social** | * Prosperous, consumerist society
* Environmentally conscious
 | * Conservative, individualistic society
* Not much environmentally conscious.
* ESCO industry-mistrusted
 |
| **Technological** | * State support to R&D and technology
* Large variety of technological solutions
 | * Not developed R&D policy
* Large variety of technological solution due to globalization
 |
| **Environmental** | * Air, land and water pollution
* High amounts of CO2
* High energy intensity.
 | * Air, land and water pollution,
* Relatively high amounts of CO2 and energy intensity.
 |
| **Legal** | * Energy Management Act
* State Energy Policy
* National Action Plan on Energy Efficiency
* Strategic framework for sustainable development
* As a whole well-developed legislation
* Administrative barriers related to bureaucracy
 | * Energy Efficiency Law
* National Long-term Programme for Promotion of Renewable Energy
* National Action Plan on Energy Efficiency
* National Strategy for Energy Efficiency
* Relatively good legislation
* Administrative barriers related to bureaucracy
 |

Table 1: PESTEL analysis comparison

Comparing the macro-environmental situation in both the Czech Republic and Bulgaria it is not surprising why these external factors are more beneficial for the ESCO market in the Czech Republic than in Bulgaria. First of all, having in mind the higher energy prices and higher level of greenhouse gas emissions in the Czech Republic, this means that there is a higher demand for these services. Moreover, the Czech Republic is benefiting from a prosperous and stable economy and easier access to capital, which facilitates the investments in EE. In contrast, in Bulgaria there is a lower demand due to the lower energy prices and barriers to the access of capital. Social and technological factors also encourage the Czech market.

## 6.2 Overall description of the ESCO market

Considering the information from the PESTEL analysis is it not a surprise that the ESCO market in Bulgaria is undeveloped and there are many barriers. However, on the other hand being an emerging market, and having in mind the increasing energy prices and environmental factors we can say that the market has a great potential for future development.

It is very difficult to estimate what exactly is the size and share of the ESCO market in Bulgaria as there is no official data presented. According to information from 2009 from the Energy Efficiency Report of Bulgaria, there are about 20 companies which describe themselves as ESCO, however only 6-7 really offer guaranteed saving and have implemented successfully ESCO projects. The first EPC project carried out in Bulgaria was realized by an ESCO KES (currently purchased by Dalkia) in 2002, in the public sector (“Bulgaria Energy Efficiency Report”, 2011).

 Currently, there is one big leader on the Market of ESCO services- Enemona. Enemona was established in 1990s and its primary activities comprised mostly of: engineering, assembly work, manufacturing and construction in the field of energy industry. At that time its main projects were related mainly with assembly work at the territory of the Nuclear Power Plant and the biggest Thermal Power Plant in Bulgaria. Since 2004, the company has enlarged its activities including ESCO services in its portfolio. Now it is the company with the largest number of successful EPC projects. Till now the company has reported to have projects with the value of 4 million EUR (“Enemona”,n.d.).

Other bigger ESCO companies that operate in Bulgaria are Dalkia Bulgaria (established by Dalkia International in 2006) and Erato holding (Bulgarian company, leader in heating equipment working on biomass, offering integrated energy management services). These companies have reported to have implemented some EPC projects. However, information about ESCs is very limited. Information shows that it is still quite unpopular and there are few projects implemented namely by Dalkia and Erato. According to Lazar Nikolaev, expert in Dalkia Bulgaria, the company has only one active ESC contract with a private client. No other information regarding current ESC projects was found (Nikolaev, 2009).

The other companies (3-4 ESCOs) that are active on the ESCO market are mainly medium-size enterprises. Along with EPC projects they offer equipment manufacturing, building and construction, services, consultancy and project management services, energy audits and building certifying, energy management. Their total project value is estimated to be around 2 million EUR (Nikolaev, 2009).

The main EPC type of contract used by these companies is shared savings contract, which means that ESCOs finance the projects and the savings achieved are used to cover the investment. Clients are not responsible for covering any debt. Usually projects in are financed thanks to the Bulgarian Energy Efficiency and Renewable Energy Fund. Mr. Dukov, CEO of the fund, explains that it is not providing any financial support in the form of grants. Instead it is providing financial guarantees to other financial institutions that would finance ESCO projects or loans with lower interest rates. Although the fund is not providing subsidies or grants, these guarantees are highly valuable as currently it is almost impossible for ESCO companies to obtain a bank loan, without the guarantees. Other means of financing are the EU operational programmes which offer support only in the public sector (Dukov, 2013).

ESC contracts are financed by clients who are provided with integrated energy management service. Clients are responsible for making fixed payments for the service offered during the contract period (Nikolaev, 2009).

Comparing the situation with the ESCO market in the Czech Republic and Bulgaria, it is obvious that due to macro-environmental factors, the ESCO business model in Bulgaria emerged much later, the number of companies providing energy efficiency service is much smaller and incentives for the development of the market are limited and do not really provide a solution to the barriers.

## 6.3 Target Group Analysis

The main target group of ESCO services is the public sector. Most ESCO projects in Bulgaria are implemented within the public sector. This includes buildings of schools, hospitals, kindergartens, municipality and other administrative buildings, street lighting contractors. The public sector is the most developed segment due to two main factors. Firstly, according to the Energy Efficiency Law in Bulgaria, public buildings with an area exceeding 1000m2 are obliged to have an energy audit and undertake energy efficiency measures in certain period. Secondly, there are possibilities for funding, for example through EU operational programmes and initiatives. Another reason is the fact that public buildings are financed by government, which removes the risk of insolvency of the client. Moreover, public buildings are usually buildings with large area, which makes transaction costs lower and the contract period shorter (Nikolaev, 2009).

Industrial sector is another target group of ESCO services. However, in Bulgaria this sector is very slightly developed. According to Mr. Dukov, one of the reasons is the political and economic crisis in Bulgaria in the 90s, when most of the industrial enterprises collapsed. Currently, industry accounts for very small part of Bulgarian economy. More recently established industrial entities have already built efficient infrastructure and equipments. Therefore it can be said that there is not much potential in the industrial sector compared to other segments (Dukov, 2013).

However, there is still a number of projects that can be realized in business and commercial buildings. The facts that owners of private enterprises where the annual energy consumption is more than 3000 MWh are obliged under the Energy Efficiency Law to take energy audits and energy efficiency measures and that there are tax exemptions for energy efficiency buildings, makes this service more demanded. Barriers in the sector are mainly related to complex and expensive technological solutions. Also the investment is seen too risky as ESCOs cannot really rely on the solvency of clients. Therefore, in this case usually the guaranteed savings contract is used (the client provides the financing) (Nikolaev, 2009).

The residential sector in Bulgaria represents the larger part of the building stock in Bulgaria. Thus, it is seen as a sector with a great potential for the application of energy efficiency measures. Unfortunately, there are many barriers that hinder the development of the market in this segment. At first place, there is a lack of awareness and mistrust among the owners of buildings. Moreover, about half of the residential buildings in Bulgaria are multi-owners. In order to have an ESCO project implemented all owners need to agree and sign individual contract, which sometimes is difficult to be achieved. Furthermore, there are not any subsidies or grants available for the residential sector. A possible way for financing is through the Energy Efficiency Fund, which can provide a loan with lower interest rate representing 75 % of whole investment. The other 25 % has to be owners’ capital. Due to the low incomes in Bulgaria, as a whole owners are not inclined to start an ESCO project.

The large amount of single residential buildings is not attractive to ESCO services as transaction costs are very high, contract period is much larger and it makes the investment senseless. However, if at least some of these barriers can be removed, this segment could be very profitable, as most of the residential buildings are highly inefficient and there is a great potential for energy savings.

 From this information it could be concluded that in Bulgaria actually there is only one sector where ESCO services are more applicable and where there have been implemented a number of projects. The other two sectors- the industrial and residential are sectors where very few projects have been carried out and where there is not much interest. Barriers in these sectors are significant and sometimes it even makes the project senseless. Although there are many constrains for the ESCO market, there is a huge potential for market growth, especially in residential sector.

In comparison with the Czech Republic we can say that there is a slight difference. The public sector is the most developed in both countries. However, in the Czech Republic the public sector could be divided by two other segments: municipality and state-owned buildings, because of the different management structure and procedure for initiating an ESCO project. The other two target groups- the industrial and residential sector are not well-developed in both countries, although in the Czech Republic there is a certain progress in this respect, mostly in the industrial sector.

## 6.4 The ESCO Business Model in Bulgaria

The following table represents the ESCO business model summarized on the Business Model Canvas. Thanks to this model a distinction can be made with the business model in the Czech Republic.

**Key Activities**

Energy audit

Identification of measures

Technical planning

Implementation

Maintenance

Measuring results

**Key Resources**

Human; Financial; Technological

**Customer Segments**

Public Sector

Private

* Few projects in industry sector
* Single projects in residential sector

**Customer Relationship**

Dedicated customer assistance +post service assistance

Creating sustainable image by indirect relationship with partners

**Channels**

Direct Distribution

**Key Partners**

Energy distribution companies

Suppliers

NGOs

Governmental Institutions

ESCO funds

EU ESCO agencies and bodies

**Value proposition**

* EPC

Integrated, customer- tailored service leading to energy consumption reduction; energy cost reduction; CO2 emissions reduction; increased comfort; satisfaction and productivity (for industrial sector)

* ESC

Integrated, customer tailored service for efficient and safe supply of energy.

v

**Cost Structure- Value driven**

Raw materials Equipment Energy purchase

 Human resources Logistics Marketing

**Revenue Stream**

EPC- revenue based in most cases on the shared-savings contract model (ESCOs are responsible for the investment of the project)

ESC- revenue which comes from the monthly fee for energy delivery agreed on the contract

Table 2: *The ESCO Business Model in Bulgaria*

Looking at the Bulgarian ESCO business model, it can be noticed that the core of the business model is not much different in comparison with the ESCO business model in the Czech Republic. Key activities and the added value that they bring are typical for the ESCO model in general. The way that the service is distributed and the way that customer relationship is created is also more or less the same as it is in the Czech Republic. In the key resources and cost structure as well there are no significant distinctions.

Although the business model of ESCO services in Bulgaria looks similar to the business model in the Czech Republic, there are some differences. First of all, regarding the target groups it can be said that in Bulgaria the most active target group is the public sector. However, it is not necessary to divide it by two separate segments (municipality and state-owned buildings) because these segments do not have specific demands, and do not require specific procedures for starting a new project. The private sector can be formally divided by industrial and residential as these segments have different characteristics and need different solutions to be applied. In the case of Bulgaria, projects implemented in these segments are only single examples, therefore the private sector in not really active in contrast with the situation in the Czech Republic.

Regarding the partners of the ESCO services in Bulgaria, there are also some distinctions compared to the Czech Republic. In Bulgaria energy companies are seen to be major partners of ESCOs. In the Czech Republic energy companies are seen more as competitors as they have also started to offer some kind of energy efficiency services. In Bulgaria major interest of these companies is to expand their grid, not to offer ESCO services. Therefore, collaboration between ESCOs and energy companies is possible. Close relationship with energy companies could be very beneficial having in mind that they have a close relationship with customers and may raise awareness about energy efficiency services. Moreover, energy companies store very important data for their customers’ energy consumption and already have measurement equipment, which could facilitate ESCOs in the measurement and verification stage.

Furthermore, suppliers (manufacturers of energy facilities and equipment) are not interested in ESCO services yet. They are focused on their core business. That is why they are more regarded as partners not as competitors as it is in the Czech Republic.

Another difference regarding the partners that can be noticed is that in Bulgaria there are not any ESCO agencies, associations and a working group to support the ESCO market. There are only few NGOs and governmental institutions supporting this industry.

Comparing the two business models in Bulgaria and in the Czech Republic we can also notice a difference in the revenue streams. In Bulgaria the most typical way of financing a project is through the shared- savings contract. In this case ESCOs provide the financing of the projects and the return on investment is directly linked to the savings achieved by the project. Only single projects in the private sector are financed via the guaranteed saving model. Thus, it can be said that it is not very popular.

## 6.5. Five Forces of Porter

In this section the well-known 5 Forces Model of Michael Porter will be used in order to make further evaluations of the ESCO industry based on the five competition driving forces. This tool will be used to determine the competitiveness and potential of the ESCO market in Bulgaria.

### 6.5.1 Threat of new entrants –Middle

The ESCO market in Bulgaria is still being in initial stage. There are few companies operating on the market. Although there is one powerful leader (ENEMONA), this cannot be considered a serious threat to new entrants as the potential of the market is huge and there are target segments that have not been entered yet.

There are no regulations in Bulgaria regarding obligations for ESCO companies to have licensees or certificates in order to perform ESCO activities. The access to distribution is not a barrier because in the ESCO model, distribution is performed directly by ESCOs. Customer loyalty also cannot be seen as a threat to new entrants because there are few projects realized and brand loyalty is not a factor.

One of the main barriers to new entrants is the lack of technological know-how. Also a potential barrier to new entrants can be considered the capital requirement. Having in mind that the most ESCOs finance the projects by own funds or through a third party, this makes it difficult for companies without the sufficient capital requirement to do so. Another threat that has an effect on new companies entering the market is the fact that when projects are implemented within the public sector there is always a public procurement procedure, which requires the executive ESCO to have implemented a certain number of ESCO projects and prove to have certain experience in the field. This requirement makes it basically impossible for new comers to enter the public sector segment. That is why, it can be concluded that the access of new entrants is at a medium level as there are not any serious threats but there are some that have certain impact on the ESCO market growth.

### 6.5.2 Threat of substitutes- High

Similar to the Czech Republic, in Bulgaria substitute services are also performed by companies providing different types of energy efficiency services which, however, do not ensure specific guarantees for savings. Also, potential substitutes are companies that provide only separate measures leading to energy efficiency. Although these measures do not give guarantees for savings and quality, people still prefer to use them, as they look less complicated and cheaper. Because of the lack of information and knowledge on the matter, people do not trust the ESCO model. Most of them consider that if they initiate a project by themselves and use different partial substitute services, the process will be easier. That is why a serious attention needs to be paid regarding this problem.

Companies that provide substitute products are similar to these in the Czech Republic, mainly companies assembling energy equipment and energy efficient appliances (SIEMENS, ABB); energy auditing and certificate companies (Energodit; Enerkon) and other companies offering energy efficiency services but not based on the ESCO model.

Having in mind these facts it can be concluded that the threat of substitutes in Bulgaria is high.

### 6.5.3 The power of buyers- Middle

The market of ESCO services in Bulgaria is not developed enough and is in initial stage. The number of ESCOs that are offering this service is much lower in comparison to other EU countries. Few projects are realized and the concentration of potential users is also not high. The service is not popular and even mistrust. Customers as a whole are not well informed regarding the conditions and benefits of the ESCO model. In this case we cannot say that the power of buyers is as high compared to the Czech Republic. However, it still can be said that they have a certain power having in mind the limited number of potential clients. In this respect companies offering ESCO services are more inclined to offer lower prices and better contract conditions. Thus, it can be concluded that the power of buyers is middle

### 6.5.4 The power of suppliers-Low

In the case of ESCO companies, it can be said the power of supplier is considerably low. On the market there are plenty of local assembly and technological facility companies (such as Aquatherm) and many international manufacturers (such as SIEMENS, ABB etc.) Therefore, ESCOs have a large choice of options for their materials. They have the possibility to choose the best products with best prices that fit their requirements without any difficulties. Moreover, many of the bigger ESCOs (such as ENEMONA, ERATO, DALKIA) manufacture most of their technological equipment, which makes them independent to a certain extent from supply of technological solutions.

In addition, in Bulgaria, manufacturers do not really have interest in ESCO services as they are more focused on their core business (probably because of the undeveloped ESCO market and small number of clients). That is why suppliers cannot be considered a competitor and a substitute service to ESCOs.

### 6.6.5 Industry rivalry-Low- Middle

Due to the initial stage of the market it cannot be said that there is a very high competition in the ESCO market. The existing rivalry on the market mainly exists between ESCOs and companies offering substitutes. As it is already mentioned in the analysis above, the ESCO business model is very unpopular and mistrusted among potential customers. That is why, in terms of energy efficiency, partial substitute services sometimes are preferred by clients. Customers are not aware of the benefits of the integrated ESCO service and are confused regarding the financing methods and contract conditions.

Considering the information presented it can be concluded that there is a middle competitive rivalry on the market which is concentrated mainly between ESCOs and other companies offering substitute services. Moreover, considering the initial stage of the market, the potential in residential and industrial sector, the high energy consumption and intensity in Bulgaria, it can be said that the ESCO market in Bulgaria is relatively attractive and by using the right information channels, establishing credibility and relationship with customers, it can be turned to a prosperous business.

After applying the Five Forces of Porter Model, analyzing and comparing the ESCO market in Bulgaria and in the Czech Republic, in the following table a systematized overview of the results will be presented in order to point the differences and form a strategic advice for new entrants.

|  |  |  |
| --- | --- | --- |
| **Five Forces Of Porter** | **Czech Republic** | **Bulgaria** |
| **Threat of new entrants** | **High*** Lack of technological know-how and experience
* Strong competition on the market
* Difficulty for new entrants in public procurement procedures
* No licenses required
* Access to distribution
 | **Middle*** Lack of technological know-how and experience
* One big player on the market, few smaller, not too strong competition
* Capital requirement
* Difficulty for new entrants in public procurement procedures
* No licenses required
* Access to distribution
 |
| **Threat of Substitutes** | **Middle**ESCO model is becoming more and more popular and preferred in comparison to other substitute services (EE services without guarantees and fragmented services) | **High**ESCO model is still not trusted and popular. Potential customers prefer to design a project by themselves and implement EE measures by using substitutes (EE services without guarantees and fragmented services) |
| **Power of Buyer** | **High*** Large number of ESCOs
* Variety of energy efficiency solutions
* Access to information
* Price sensitivity of customers higher requirements
 | **Middle*** Limited number of ESCOs and clients
* Not enough information regarding the benefits of ESCOs
* Price sensitivity of customers
 |
| **Power of Supplier** | **Middle*** Large variety of equipment, facilities, and raw materials providers.
* Most of ESCO manufacture themselves energy equipment
* At a certain point some of suppliers are seen competitors
 | **Low*** Many local and international suppliers
* Bigger ESCOs manufacture themselves the necessary equipment
* Suppliers are not considered competitors
 |
| **Competitive Rivalry** | **High*** Large number of ESCO companies,
* Large potential of customer,
* Threat of substitutes,
* Barriers to new entrants,
* Price sensitive and demanding customers
 | **Middle*** Major competitors are substitute services and bigger ESCOs;
* As a whole not yet developed market;
* Not popular services;
* Not much information available.
 |

Table 3: *The Five Forces of Porter Business Model in the Czech Republic and Bulgaria*

Strategy advice for entering the market:

By outlining and comparing the Five Forces of Porter existing on the ESCO markets in both the Czech Republic and Bulgaria, a strategy advice for ESCO companies entering the market in Bulgaria can be made.

Having in mind the fact that the market in Bulgaria is not mature, with not significantly high barriers to new entrants, with a large variety of suppliers, and there is not such intense competition, it can be concluded that according to the Five Forces of Porter the market is relatively attractive. Combining these factors with the constantly rising energy prices and environmental footprint, it can be said the there is a great potential for ESCO services in Bulgaria.

However, if a company is willing to enter the ESCO market in Bulgaria, it has to consider several important factors.

First of all, deriving from the Porter’s analysis, companies entering the ESCO market need to consider their human resources. In a business of this kind, the qualified and experienced workforce is playing the most essential role. Secondly, constant trainings and education is necessary for companies in order to rely on the best technological solutions and know-how. The capital requirement is also necessary to be considered as ESCO services are expensive investments with a long payback period. All options for finding capital have to be considered.

Regarding the threat of substitutes and the competition that are existing, potential ESCOs need to pay serious attention on marketing (which is currently not taken into serious consideration). They have to ensure that they provide the most innovative and quality solutions, the best prices and contract models that stand out of the crowd. Therefore, there is a need for a clear differentiation from substitutes. Also, a special accent should be put on the promotion of these services, and mainly on the dissemination of information regarding the benefits of these services, and highlighting that only the ESCO business model gives guarantees for savings. Fragmented energy efficiency services could be useful, but they do not provide the same quality and energy savings. Providing detailed information on the contract forms, term and conditions would increase the credibility among customers.

Another important point that requires attention is that potential ESCO companies should establish closer relationship with clients and understand their individual needs and try to adapt the ESCO model as much as possible to customer preferences and establish better and easy to understand contract conditions.

Last but not least, before a company is willing to enter the ESCO market, it needs to have already created a network with partners and potential suppliers. ESCO services are not simple solutions and the successful implementation of projects is also related to stable relationship with suppliers and partners. Moreover, the promotion of the ESCO business model, as a whole is related to the relationship with partners such as governmental and non-governmental institutions, agencies associations, financial institutions, etc.

## 6.5 Still Existing Barriers

Although attempts are made towards the facilitation of the ESCO market in Bulgaria, there are still serious barriers that hinder the market growth. Based on the extensive analysis of the ESCO market in Bulgaria, the current section will describe briefly the existing barriers.

* Energy prices: One of the main benefits of ESCO services is the achieved energy savings. Therefore, energy price has a crucial impact on the demand and the profit from energy efficiency services. In Bulgaria in recent years the energy prices are constantly raising and the savings measures are becoming more and more common. However, still the energy prices in Bulgaria are the lowest in the EU, which is seen as the biggest barrier for the more rapid growing of the ESCO service market.
* No baseline data: Another major barrier which occurs when we are talking about ESCO services is the fact that no baseline data regarding the energy consumption is available (mostly in the private residential sector), which makes the estimation of energy consumption and savings difficult. Lack of this information questions the effect of the project as this data has a key role in the whole calculations process in the project. There are many examples of unsuccessful projects mainly due to lack of this data. Then the poor results in energy savings increase the mistrust in projects (Dukov, 2013).
* Evaluation of results: Problems occur as well in relation to the accurate evaluation of the achieved results after the ESCO projects are realized. Measurement and verification is a very essential phase of the project, which gives important information on the results. Problems in this part of the value chain can lower the satisfaction among customers and again decrease the demand for the service. In addition, according to L. Nikolaev expert in the sector, clients are suspicious that EES providers will track the results, so clients prefer to be in charge of this by themselves. Also, clients believe that they can make it better than the EES provider (Nikolaev, 2013).
* Lack of experience and awareness: Being relatively new kind of services in Bulgaria, there is not much experience in the field. Lack of technical experience, poor project management skills and marketing are observed. The lack of information and awareness; mistrust and suspiciousness among customers are major problems regarding ESCO services.
* Legal and bureaucratic problems: Another barrier that hinders the ESCO market growth is the fact that although there are some legal incentives supporting ESCO services, the initiatives are still not sufficient. There are certain obligations to larger energy consumers for applying energy efficiency measures; however the legislation is not giving clear requirements and deadlines. The complex framework and contract types are also significant barriers in this respect. The clumsy bureaucratic system is also causing difficulties and slowing the procedure when a project is initiated.
* Financial problems: Financial problems are also seen as serious obstacles to the growth of the ESCO market. Obtaining a bank loan is becoming more and more difficult. Usually banks see these kinds of credits as highly risky. Due to the financial crisis also interest rates are too high and make the investment unfavorable. Local ESCO funds do not provide financial support in the forms of grants. They only provide guarantees for banks in order to ESCOs in obtaining capital or they offer themselves the ESCOs loans with lower interest rates. Furthermore, most private clients require shorter payback periods, which is impossible for the ESCOs to return their investment.

# 8. Conclusion

Energy efficiency services, being recognized as an innovative and effective solution for addressing environmental challenges, have become a political priority for the EU. Therefore, it is essential that each member state ensures favorable business environment for the development of the ESCO market. However, ESCO markets in EU countries are not at the same level of development.

The report has limited its scope to the ESCO market in the Czech Republic and Bulgaria, two EU countries where the ESCO market is at different level. In the Czech Republic there is an advanced market, while in Bulgaria there is a market in initial stage. Thus, the aim of this report is to analyze both markets by answering the research sub-questions questions: What are the main differences, main incentives and barriers for the ESCO market in both countries, and afterwards in the recommendations section to answer the general research question of this report: What good practices that facilitated the development of the ESCO market in the Czech Republic could be enabled in Bulgaria as well?

Research results show, that comparing both countries, there are significant differences in the macro-environmental factors that are shaping the ESCO market. The most important factors that are related to the demand of energy efficiency are energy price and the increasing amount of greenhouse gas emission. Czech Republic is a country with the highest levels of CO2 emissions in the EU and relatively high energy prices, therefore it is not surprising why it has well-developed ESCO market. In contract, in Bulgaria are present lower amount of greenhouse gas emission and the lowest energy prices in the EU.

Furthermore, in the Czech Republic we see far more favorable political and economic conditions, open, liberalized energy market which has beneficial effect on the ESCO industry. In contrast in Bulgaria the whole political system and energy sector are not working properly, which respectively is creating obstacles for ESCOs

In addition, the Czech Republic is a country where the ESCO business model was introduced for the first time in the 90s, much before Bulgaria. To a certain extent this explains the experience in the sphere and the much larger number of ESCOs, projects implemented and size of the market. In Bulgaria, due to the economic crisis in the 90s these processes appeared much latter.

Apart from political and economic conditions, in the Czech Republic we notice more initiatives for development on ESCO side. That is the reason why, they are considered the drivers of the market. Many ESCO representatives are also members of working groups, agencies and associations, initiating and developing different proposals for incentives for the market. In Bulgaria this activity is not as popular as it is in the Czech Republic.

Another difference between the market in Bulgaria and in the Czech Republic is the fact that in the Czech Republic there is more intense competition than in Bulgaria. The number of powerful ESCOs with experience in the matter is higher and barriers to new entrants are also more in comparison to Bulgaria. That is why from this point of view the Bulgarian market could be described as more attractive due to the easier access to the market.

Although there are many limitations to the ESCO market in both countries, it is admitted that it has been achieved a lot in relation to the establishment of some incentives for the ESCO market. Apart from the standard for every country legislation, strategies and plans of action, in the Czech Republic, there are many other initiatives supporting the ESCO business. In the Czech Republic these initiatives come more from the ESCOs themselves, whose managers often participate actively in working group and draw proposals. Moreover, there are many agencies and NGOs working as well in direction of popularizing these services. Different financial programmes providing support have also a huge impact.

Bulgaria has also adopted Energy Efficiency Act, National Plan of Action and a National Strategy; however, they do not have a great effect on the ESCO market. ESCOs are not as active as these in the Czech Republic and the number of agencies and NGOs contributing to the ESCO market development is much lower. One of the main incentives for the market is the establishment of The Bulgarian Energy Efficiency and Renewable Energy Fund, which provides financial guarantees for ESCO projects in different sectors.

Barriers that are hindering the ESCO market in both countries are related to administrative barriers, lack of know-how and awareness, financial difficulties. In Bulgaria serious barrier are the low energy prices which lower the demand for EE; the lack of baseline data for energy consumption of customers; mistrust to energy efficiency services as a whole.

Considering the information presented, it can be used for forming recommendations (which can be find in the following section) for the development of the ESCO market in Bulgaria, based on the experience from the Czech Republic.

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# 7. Recommendations

After carefully analyzing the context and background of energy efficiency services, the ESCO market in both the Czech Republic and Bulgaria, and answering the sub-questions, this section is going to give an answer to the central research question and subsequently give recommendations for the development of the ESCO market in Bulgaria based on the experience of the Czech Republic.

One of the major barriers to ESCO services in Bulgaria is still the low prices of energy, which do not really stimulate energy consumers to initiate energy efficiency measures. However, the future tendencies are that the prices will be constantly rising and this barrier will be overcome naturally from the market processes.

Currently, the most important measures that need to be taken in order to encourage energy efficiency are governmental reforms in energy sector, work towards the liberalization of the energy market, encouragement of competition and recognizing energy efficiency as a priority. In the Czech Republic namely the liberalized market and the competition between different energy providers is the driving force towards energy efficiency and ESCO services. Without political will development of the market would be impossible.

Political and legal incentives are the base for developed and well-functioning market. In legal aspect there are some incentives that would stimulate the growth of the market. Currently, when ESCO projects are initiated in the public sector, a public procurement procedure is necessary. In this process the executing ESCO is required to prove a certain level of experience and expertise in the field. This requirement basically eliminates new entrants from the market. Therefore, a change in the public procurement procedure would encourage new ESCOs to enter the market.

Residential sector, representing a great potential and need for energy savings, is one of the most undeveloped segments. That is why obligatory EE measures for multi-owners residences (representing large energy consumers in the sector) would stimulate the development of the ESCO market and contribute to the achievement of Bulgaria’s energy saving targets.

The lack of baseline data on energy consumption is seen as one of the biggest barriers to the ESCO business model. Special legislation regarding the record of energy consumption of large energy consumers would be very important for the successful implementation of EE measures.

Simplification and standardization of the contract types and administrative procedure would be also very beneficial to the development of the ESCO market by increasing motivation and credibility in customers to initiate a project.

Other major need that has to be considered in relation to the development of ESCO market in Bulgaria is increasing knowledge and expertise; raising awareness; dissemination of information; of energy efficiency services. In this respect there is a need for organizing trainings; workshops; seminars; information campaigns. For instance the training of ESCO companies that has been held in the Czech Republic in the 90s, had very beneficial effect on the establishing of know-how and experience among energy service providers. That is why such training would be highly beneficial as well in Bulgaria. This training programme could include different modules such as: exchange of best practices and technological and engineering solutions in the field, extended information sessions regarding the financing of ESCO projects (energy efficiency funds, operational programmes, bank loans, etc), ESCO business itself ( different ESCO contract arrangements and models, legal and tax conditions, marketing activities), project management sessions.

Furthermore, it is important that massive information campaigns are organized to popularize the ESCO business model and benefits from energy efficiency among society. In the Czech Republic the EFEKT programme, financed by the Czech government aiming to promote EE and the ESCO business model to general public was quite effective. Organization of educational events, information days in local municipalities, and inclusion of sustainable development and energy efficiency issues in the educational programme in schools would increase awareness and credibility of these services.

In addition, on ESCO side, companies should become more active and entrepreneurial. In the Czech Republic ESCO are considered the main drivers of the ESCO market, not the state. Therefore, establishing working groups, and associations (as it is the Czech Republic), would be quite supportive for improving the political and legislation model. By establishing working groups under the Ministry of Energy, Economy and Trade, representatives of ESCO companies could affect legislation in positive direction by initiating proposals in favor of the ESCO market and energy efficiency practices as a whole.

In terms of finance, financial support of these activities (in terms of grants, soft loans, etc.) is very essential for the motivation of customers. In the Czech Republic important role had financial support in form of grants and subsidies. In Bulgaria only subsidies in the public sector are possible. For other sectors the only options are low interest loans and financial guarantees. More financial options for ESCO projects would be highly necessary for further development of the market.

The establishment of an ESCO association would also be a good option for facilitating ESCO market. The association would play as link between ESCO providers, customers, national authorities, financial institutions and other stakeholders. It could work as an advisory body, providing information and organizing promotional events.

In conclusion, in Bulgaria there is a great potential for ESCO services, which would also lead not only to significant energy savings and greenhouse gas emissions reduction but would also have essential economic and social effect. Making efforts in achieving these recommendations would have quite beneficial impact on the overall development of the ESCO market in Bulgaria**.**

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# 10. Appendix

E-mail Interview: Jana Szomolányiová, senior consultant at SEVEn, the Czech Energy Efficiency Centre

Questions:

1. What is the size of the ESCO market in the Czech Republic (approx. annual value of projects)?

200 mil. CZK

2. How many companies have implemented EPC in the last five years (approx.)?

50

3. How many companies have implemented ESC in the last five years (approx.)?

Several hundreds

4. To what extent is developed the residential sector as a target segment for ESCO services?

None

5. Usually how are projects within the private sector financed? Guaranteed savings contract (client financing) or shared savings contract (ESCO financing)?

Guaranteed savings

6. Are there barriers for new entrants? Is it difficult to enter the market in the Czech Republic?

Yes, as in every business sector. The most important barrier is a lack of know-how and experience. Within standard engineering works the energy savings are not maximized like in the EPC. It is hard to win the first projects due to lack of experience and no references.

7. Is there an intense competition on the market?

Yes

8. Does the customer have high power? Is he able to put companies under pressure?

Yes as a result of an intense competition. He is able to put the companies under pressure within the tender procedure.

Interview Transcript- D. Dukov, manager Energy Efficiency and Renewable Energy Fund, Sofia, Bulgaria

Translated from Bulgarian- Evelina Taslakova

E: Mr. Dukov, how many ESCO projects have been implemented in Bulgaria?

D: It is very difficult to say the exact number of the implemented projects as there is not any official database or registry where all ESCO projects carried out in Bulgaria are entered. I can only speak about the projects that have been financed through the Energy Efficiency Fund. In total we have financed 143 energy efficiency projects, from which 29 were based on the ESCO model with a value of about EUR 8 million.

E: What actually are the functions of the Energy Efficiency Fund? What kind of financial support does it provide?

D: The Energy Efficiency Fund was established under the Energy Efficiency Law in Bulgaria and operates in correspondence to the existing legislation. Donors of the fund were the International Bank for Reconstruction and Development, providing USD 10 million; the Austrian Government – EUR 1,5 million and the Bulgarian government- providing another EUR 1,5 million. The fund is functioning as a financial and consultancy body, which supports energy efficiency projects in all spheres. The fund does not offer financial support in the form of grants. We only give loans with lower interest rates and financial guarantees to other financial institutions, if we consider that the debtor fulfills our requirement. From our experience, I can say that the fund is one of the major stimulation for the energy efficiency market in Bulgaria. Nowadays it is almost impossible to obtain a bank loan for energy efficiency, not only because of the business risk, but because in order to evaluate the feasibility of an ESCO project, a significant technological knowledge is required and most banks cannot really take such kind of decisions.

E: When you finance an ESCO project to whom is issued the loan? Is it provided to the ESCO that is going to implement the project or to the final consumer?

It depends on the individual situation, type of the project, the specific requirements etc. Both cases are possible. We have also had some case in which we issue loans to both the ESCO provider and the end consumer of the service.

E: As far as I know most of the project are implemented within the public sector. However I could not find much information about the residential sector. What is your experience with this target group?

D: Implementation of ESCO projects within the residential sector is very difficult. There are only few project implemented in this sector. The main problem here is organizational- lack of knowledge, motivation and initiative of owners. According to the law, there is no clear obligation for owners to implement energy efficiency measures. That is why they do not find it necessary to start a project. Most of the residential buildings in Bulgaria are multifamily buildings with a large number of owners. In order to receive a loan, all owners need to sing an individual agreement contract with a financial institution. Moreover only 75 % of the investment could be issued as a loan, the other 25 % have to be provided by owners. In this respect, having in mind the low incomes of the mass population, it is clear why people are not motivated.

E: And what is the situation within the industrial sector?

D: There are also few projects implemented within the industrial sector. The reasons here are mainly related with the crisis in the 90s, when most of the industrial enterprises in Bulgaria bankrupted. There are very few that survived and are currently operating. Therefore, the potential in this sector is not big. Relatively new industrial companies, when they start their activity they take into consideration modern and efficient facilities and equipments.

E: In other words you think that the residential sector has more potential?

D: Yes, definitely in this sector there is a lot of potential.

E: In relation to the existing legislation do you think it is favorable to ESCO market?

D: Yes, I can say that Bulgaria has a very good legislation, which is supportive to the ESCO industry. But anyway, I don’t think it is the largest problem with the ESCO. We had very successful projects implemented even before the Energy Efficiency law in Bulgaria was created.

E: Than what is the biggest barrier?

D: The main barrier is that energy consumers do not keep track on their consumption and there is no base line on which ESCO projects are initiated. It is very important that when an ESCO project is designed there is data of what was the energy consumption before as this is the base on which all calculations are made. If this data is not correct, then probably the savings guaranteed will not match.

E: Do you think lower energy prices are also a barrier to the development of the ESCO market.

D: Yes they are a barrier, however I don’t think in Bulgaria prices are low. They are almost at the same level of the prices in other EU member states.