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ESC0 Market Report 2013

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Abstract

The current report, which is the 4th in the series, depicts the status of the ESCO markets as of 2013, and the changes since 2010 are investigated. The report starts with some theoretical background, providing a definition for ESCOs and relevant concepts that have been used in the report. This is followed by the listing of key background information in the European context.

CW 4da^_TP] ESCO Market Report 2013

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** This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence*

Introduction

During the last decade the European Union and its Member States have dedicated large efforts to cut energy wastage and improve energy efficiency on both the demand and supply sides. In parallel energy users have been increasingly interested in cutting their energy costs, applying sustainable construction methods, and searching for long term, trustful, financially viable solutions in energy use. Among many prerequisites, these aspirations need to be backed by financial solutions, technical and technological expertise, management creativity, market knowledge and communication abilities. Energy Service Companies (ESCOs) are able to offer many of these requirements and thus have become integral part of the European energy efficiency market.

The European Commission DG Joint Research Centre has regularly published information about the Energy Service Company markets since 2005. The ESCO market status reports are published every 2-3 years to provide a snapshot of the key developments of the national and the EU markets. The ESCO report series focus on collecting information about the market features and structures, barriers, policy background, financing opportunities and future expectations. The reports also summarize the findings at a European level, collect common barriers and success factors, and compare and contrast the national markets. While the primary territorial scope of the reports is the European Union (EU-28), they also provide information about neighbouring countries.

These reports have been useful for ESCO companies, interested potential ESCO clients, as well as policy makers at EU and national levels and energy efficiency experts. While the reports are meant for a professional audience, nonetheless the general public may find them interesting to understand the concept and the local ESCO and energy efficiency situation. It is hoped that the present publication will serve well again in providing an up-to-date, overall but locally relevant portrait of the present and the expected future of this crucial sector.

The current report, which is the 4th in the series, depicts the status of the ESCO markets as of 2013 and the changes since 2010. The report starts with some theoretical background, providing a definition for ESCOs and relevant concepts that have been used in the document. This is followed by the listing of key background information in the European context.

During these past 3 years most of the EU and neighbouring ESCO markets have grown and developed their complexity. The concrete changes are discussed for each of the 28 EU Member States and 15 other European countries. Drivers as well as obstacles to a wider proliferation are taken under a microscope in the country chapters and in the conclusions. These chapters are meant to be of practical use for readers that are interested in learning about a particular country and can be read as stand-alone documents..

The report closes with a conclusion chapter that gives a general overview about Europe, as well as a comparative summary of the surveyed national markets. The future of the ESCO model and of these markets is also discussed.

Background

What is an ESCO?

The lack of a common definition, clear and simple identification of ESCOs was regularly quoted as main barriers to the wider spread of the ESCO model in Europe, because it resulted in problems with trust and therefore a limitation in ESCO project demand (Marino et al. 2010).

Definitions have been provided lately, which are meant to be used Europe-wide and as a consequence it has become somewhat easier to overcome problems with understanding and trusting the ESCO concept. The first common standard meaning was put forward by the EN 15900 standard in 2010, and later by the Energy Efficiency Directive (EED, 2012/27/EU) in 2012.

The EED defines an 'energy service provider' as a "natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer's facility or premises", while 'energy performance contracting' (EPC) is understood as a "contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings".

In this report, the authors use a slightly different definition of an ESCO (an energy service provider, an energy efficiency provider or energy service company), i.e. herein an ESCO is "**a company that offers energy services which should include implementing energy-efficiency projects (and other sustainable energy projects). Many ESCOs work on a turn-key basis.**" In this series of market surveys carried out by the European Commission, Joint Research Center, the three main characteristics of an ESCO are as follows¹:

- ESCOs **guarantee energy savings and/or provision of the same level of energy service at lower cost**. This is referred to as a **performance guarantee**, which can take several forms. It can revolve around the actual flow of energy savings from a project, can stipulate that the energy savings will be sufficient to repay monthly debt service costs, or that the same level of energy service is provided for less money.
- The **remuneration** of ESCOs is directly tied to the energy savings achieved;
- ESCOs **can finance, or assist in arranging financing** for the operation of an energy system by providing a savings guarantee.

Therefore ESCOs accept some degree of risk for the achievement of improved energy efficiency in a user's facility and have their payment for the services delivered based (either in whole or at least in part) on the achievement of those energy efficiency improvements.

In principle, energy services include a wide range of activities, such as (based on Bertoldi and Rezessy (2005)):

- energy analysis and audits,
- energy management,
- project design and implementation,

¹ <http://iet.jrc.ec.europa.eu/energyefficiency/esc>

- maintenance and operation,
- monitoring and evaluation of savings,
- property/facility management,
- energy and/or equipment supply,
- provision of service (space heating/cooling, lighting, etc.),
- advice and training,
- etc.

Therefore companies that offer energy services (one or more of the above in the list) to final energy users, including the supply and installation of energy-efficient equipment, the supply of energy, and/or building refurbishment, maintenance and operation, or facility management, are **Energy Service Provider Companies (ESPCs)**. They may be consultants specialised in efficiency improvements, equipment manufacturers or utilities. ESPCs provide a service for a fixed fee or as added value to the supply of equipment or energy – as opposed to ESCOs. ESPC may have some incentives to reduce consumption, but these are not as clear as in the ESCO approach. Often the full cost of energy services is recovered in the fee, so the ESPC does not assume any risk in case of underperformance. ESPC is paid a fee for their advice or equipment rather than being paid based on the results of their recommendations.

ESCOs and ESPCs are typically profit-oriented private (sometimes public) organisations. However, in recent years non-profit arrangements have come to existence. For example, an ESCO may be set up, run and owned by a community, whereas this company replaces the traditional energy supplier. A so called “**Community ESCO**” would not aim for profits, but would reinvest its gains in the local energy system (or in other parts of the local economy). An already working example is found in the UK, while Hungary has plans to transform one of the ESCO projects where large number of multi-apartment buildings and their supply systems are renovated. Through these organisations, pursuing sustainable development, climate goals, or other socially and environmentally benevolent goals overrides profits.

ESCO contracts

By definition, ESCOs conclude **energy performance contracts (EPC)** with clients, the core of which is a performance guarantee – as described above. At the same time, EPC can be drawn in various sub-forms. Also, ESCOs often offer other versions of energy service contracts. Therefore, in line with the *European ESCO Status Report 2005* and the following *European ESCO Status reports*, the alternative contract types need to be defined for the purpose of the present report.

EPC models

An EPC may follow the “**shared savings**” or the “**guaranteed savings**” model. This distinction reflects the different distributions of investments, savings and risks between the client and the ESCO (Langlois and Hansen 2012). In the shared savings model, the ESCO provides financing for the investments, who in return gets a share of the savings. There is no standard split of the share of the ESCO vs. the client, as it will depend on the length of the contract, the payback time and the risks taken (Bertoldi and Rezessy 2005). It is most common that the cost savings are guaranteed in a shared savings EPC (Bertoldi and Rezessy 2005). On the other hand, in projects using the guaranteed savings model the client can usually provide the project budget. Therefore, the client will pay for the services of the contractor (who implements and operates solutions) and for the performance guarantee, which is usually given in the form of energy savings (Jensen, Nielsen, and Hansen 2013; Bertoldi and Rezessy 2005). The previous version is more common in a starter market, or after financial problems, because the clients have

limited access to capital, and prefer the ESCO project over own financing (also) because of its financial product (Bertoldi, Boza-Kiss, and Rezessy 2007).

Another variation is the ‘first out’ approach whereby the ESCO is paid 100% of the energy savings until the project costs – including the ESCO profit – are fully paid. The exact duration of the contract will actually depend on the level of savings achieved: the greater the savings, the shorter the contract (Bertoldi and Rezessy 2005).

Other ESCO contracts

In contrast to EPC, “**Delivery Contracting**” (DC, also known as Supply Contracting or Energy Supply Contracting (ESC)) is focused on the supply of a set of energy services (such as heating, lighting, motive power, etc.) mainly via outsourcing the energy supply. **Chauffage**, one of the most common contract types in Europe besides EPC, is a form of Delivery Contracting. In a chauffage arrangement the fee for the services is normally calculated based on the client’s existing energy bill minus a certain level of (monetary) savings, with a guarantee of the service provided. Alternatively, the customer may pay a rate, for instance, per square meter (Bertoldi and Rezessy 2005). The ESCO (or ESPC) may also take over the purchase of fuel and electricity.

The terms EPC and ESCO are not widespread in the UK and Ireland (Bertoldi, Boza-Kiss, and Rezessy 2007), and instead ESCO-type work is referred to as **Contract Energy Management (CEM)**, which means “the managing of some aspects of a client’s energy use under a contract that transfers some of the risk from the client to the contractor (usually based on providing agreed ‘service’ levels)” (Sorrell 2005).

In the Nordic countries/Scandinavia, contracts similar to DC are referred to as “**comfort contracting**”, and in these contracts the provision of the level of comfort or level of service is outsourced to the ESCO firm. These contracts will go beyond the provision of energy for the level of comfort, and take care of full maintenance, including a healthy indoor environment, aesthetics, etc.

In Italy, “chauffage” is equivalent to “**heat supply contracts**” (or “Servizio Calore” in Italian). These are however substituted by the stricter “**Energy Service Plus contracts**” (“servizio energia plus”), which also includes a commitment by the provider to reduce the consumption of primary energy for winter heating by at least 10% with respect to what is indicated in the building certificate. Furthermore, it commits to the installation of a temperature control system, when possible.

A **BOOT** model involves an ESCO designing, building, financing, owning and operating the equipment for a defined period of time and then transferring this ownership across to the client. This model resembles a special purpose enterprise created for a particular project. Clients enter into long term supply contracts with the BOOT operator and are charged accordingly for the service delivered; the service charge includes capital and operating cost recovery and project profit.

Integrated Energy Contracting (IEC) is a new model, which combines EPC and DC and thus increase the amount of energy cost savings. When designing the project, demand side measures are planned as a priority, and the remaining level of energy needs are covered by more energy efficient supply, when possible. Therefore an IEC combines the benefits of the demand and supply side measures, therefore reaching a higher cost-benefit. At the same time, the contract is simpler than a normal EPC, which also reduces expenses (Bleyl 2012; Wargert 2011).

Financing an ESCO project

While financing is not supposed to be the key part of an ESCO offer, it is very common that the contractor provides or arranges for the financial terms of the project. In **ESCO financing** the energy service provider participates with its internal funds and pre-finances the investment and other costs. In the **customer financing** model, the ESCO does not participate in the financial solution of the project, but instead its role is restrained to the technical and managerial aspects.

Third-party financing (TPF) refers to debt financing. In this solution, project financing comes from a third party, typically a finance institution, and not from internal funds of the ESCO or of the customer. The finance institution requires collateral in return to the loan. Ideally, the bank may assume the rights to the energy savings, but more commonly it will take a security interest in the project equipment or other property of the borrower. The borrower can be the ESCO or the client. In the latter case, the client is secured by the performance guarantee issued by the ESCO, which reduces its financial risk (and with which the ESCO participates in this risk).

Forfeiting² started to be interesting for EPC projects in the period 2000-2005. It involves the long-term sale of (future) receivables, i.e. the bank wires the costs (of the equipment, hardware) to the ESCO at the time of completion of the project set-up, when the equipment has been installed. The customer is obliged to complete the periodic fixed payments to the bank based on an agreement directly³ between the bank and the customer. In normal EPC projects, around 5% of the total guaranteed savings are backed up by a bank guarantee, as opposed to forfeiting, where this increases to 10% (EC JRC 2012).

A comparison of some of the key features of the alternative models is given in Table 1.

Table 1. Division of role and tasks between the ESCO and the client.

	Whose balance sheet?	Performance risk lies with	Financial risk lies with	Is there project specific financing?
shared savings EPC	ESCO	ESCO	ESCO	yes
guaranteed savings EPC	customer	ESCO	ESCO/customer	yes
“chauffage”	ESCO	ESCO	ESCO	no

For further terms and definitions used in the current report (related to financial schemes, contract models and project elements), please refer to the *European ESCO Status Report 2005*.

Benefits of an ESCO project

Renovations, including energy refurbishment may be carried out in various constructions. Building owners must consider whether doing it on their own would be better or by using an ESCO (or other mechanisms). The ESCO usually offers turnkey services, and serves not only as a simple contractor, but as a project manager, guarantor, financier, etc. One of the key benefits is that the ESCO has direct contacts with subcontractors and the client only takes care of the successful choice of one single

² also referred to as factoring

³ indirect payment is also possible, but not common

company (Table 2), meaning a quicker and simpler contractor selection (tendering in case of public clients), easier monitoring and partnership building.

Table 2. The number of partners and the variety of contractors in a project with own investment vs. an ESCO project: one of the benefits of ESCOs is the simpler contracting and partnerships.

	Own investment	ESCO project	
Preparation	Company A	ESCO	
Implementation	Company B		Subcontractor A
Financing	Company C		Subcontractor B
Purchase of primary energy	Company D		Subcontractor C - Bank
Operation and management	Company E		Subcontractor D
		Subcontractor E	

An ESCO project is beneficial from several viewpoints, even beyond the participants. While ESCOs are not the universal remedy for energy demand growth and sustainable development, they definitely have an important role to play in the energy efficiency markets and in achieving micro and macro level goals (Figure 1).

<p>Property owner (client)</p> <ul style="list-style-type: none"> • Energy cost savings (or other utility cost) • No or low upfront cost • Healthier indoor environment • Increase of comfort • Building value increase • Additional renovation components (aesthetics, status improvement, extension, etc.) • Public image/prestige 	<p>Municipality/community</p> <ul style="list-style-type: none"> • Jobs – more balanced community • Growth of the value of the building stock and more attractive district/area • Healthier district • Independency • Development of communities <p>-> competitive benefit</p>
<p>ESCO/contractor</p> <ul style="list-style-type: none"> • Workplace • Profit • Long-term, reliable partnership • Possibly further contracts with the same partner 	<p>Macroeconomy</p> <ul style="list-style-type: none"> • Jobs • Development of real estate market – growth of GDP • Motivation of residents’ and/or investors to spend money locally • Growth of energy security, decrease of need for

Figure 1. Benefits of ESCO projects from the points of view of stakeholders. Based on: Hungarian Energy Center (2009)

The funds for an energy efficiency project/investment can originate from a number of alternative sources. The choice amongst them also corresponds to alternative set of risks, which should be carefully taken into consideration at project preparation (see Table 3).

Table 3. Comparison of various financing forms of energy efficiency investments in terms of sharing risks. Note: there are many variations even among categories. Based on: Hungarian Energy Center (2009).

	Investment risk	Operational risk	Credit risk	Inflation/exchange rate risk	User behaviour risk	Total costs
own investment	Municipality	Municipality	Bank	Municipality	Municipality	
third party financing	ESCO	Municipality	ESCO	ESCO or municipality	Municipality	
leasing/rent	ESCO	Municipality	ESCO	ESCO	Municipality	
ESCO/EPC	ESCO	ESCO	ESCO	ESCO	Municipality	
forfeiting	ESCO	ESCO	Bank	Bank	Municipality	

The EU framework

The European Commission has long been stimulating the ESCO industry and TPF through legislation and programmes. This support has been accelerated during the last few years.

The first initiative was in 1988 when the European Commission adopted a Recommendation to Member States to promote ESCOs and the use of TPF, defining TPF and describing how ESCOs operate. In 1992, the European Council and Parliament adopted a Directive (93/76/EC), which invited Member States to design and implement programmes to use TPF in the public sector. Under the European Commission's THERMIE and SAVE programs, several studies and pilot projects were implemented to spur ESCO and TPF activities, mainly in public buildings and combined heat and power (CHP). In 1996, two standard ESCO-type contracts were published – for buildings and for industry. In 2002, the European Commission's GreenLight Program identified ESCOs operating in the lighting field, and created a preliminary list of ESCOs (see <http://iet.jrc.ec.europa.eu/energyefficiency/greenlight>).

In 2003, the European Commission DG JRC conducted its first survey of ESCOs in the EU, resulting in the creation of the first online EU database of ESCOs (currently available at http://iet.jrc.ec.europa.eu/energyefficiency/organisation-list-short/esco_partner). This database was then placed on an ESCO subsite managed by the EC JRC (currently at <http://iet.jrc.ec.europa.eu/energyefficiency/esco>). Every year, the EC JRC organises its annual ESCO workshops (<http://iet.jrc.ec.europa.eu/energyefficiency/upcoming-events>), where participants discuss the status of ESCO markets and energy efficiency financing, in particular in the New EU Member States.

In recent years the EU has increased efforts to boost the European and national ESCO markets, in particular through:

- Directives ESD (2006/32/EC), EED (2012/27/EU)
- prEN15900 standard
- EU EPC campaign
- European Energy Efficiency Fund (EEE-F)
- ESCO market research (done regularly by the EC JRC)
- Database (JRC and **Transparens**)
- IEE projects, such as Eurocontract, EMEEES, ChangeBest, Permanent, **Transparens**, EESI, EESI2020, Combines, etc.
- FP7 projects: good examples, business models

These EU-level measures are complemented by large number of national and local level actions (see the country chapters).

The following subchapters provide further information on specific EU-level measures and policies that contribute to the growth and strengthening of the ESCO market.

European legislation

The strength of the European legislation in relation to its contribution to the development of the ESCO industry has been gradually growing. The **Energy Efficiency Directive (2012/27/EU)** is in the centre of this set of measures.

On 22 June 2011, the EC proposed a new Directive that brings forward legally binding measures to step up Member States efforts to use energy more efficiently at all stages of the energy chain – from the transformation of energy and its distribution to its final consumption. The Directive entered into force on 4 December 2012 and the deadline of transposition is 5 June 2014.

There are a number of provisions relevant for the EPC/ESCO sector (see the interrelations in Figure 2). The most central element is **Art 18**. “Energy services”, which is a dedicated provision for the empowering of the ESCO solution. The articles requires Member States to

- ensure access to clear information about EPC contracts (in particular about guarantees and customers’ rights), financial instruments and opportunities for energy efficiency projects;
- encourage the development of quality labels;
- develop and ensure access to a list of certified and/or qualified service providers;
- support the public sector to use ESCO services ;
- identify and publicise points of contact, where final customers can receive help;
- remove regulatory and non-regulatory barriers;
- find a solution for proper handling of complaints by customers;
- enable independent market intermediaries; and furthermore
- ensure that energy distributors, distribution system operators and retail energy sales companies refrain from blocking the market of energy services and do not abuse their dominant position.

With these requirements, the EED has put forward a complex set of actions in all Member States that deal with issues of barriers, increasing transparency and trust, while actively assisting in the provision of proper information to the potential customers and improving the market position of ESCO-type entrants.

Furthermore, the EED includes provisions that have a side effect on the ESCO market. The most promising of these is in **Art. 7**, mandating energy efficiency obligations for energy companies (the exact list of participants to be identified by the Member State) with energy saving targets equivalent to 1.5% of their final energy sales for final customers⁴.

Another possible driver of the ESCO industry is **Article 5**, which requires the renovation of 3%/year of the total floor area of heated and/or cooled buildings owned and occupied by the central government. In addition, the leading role of the public sector is expected to disseminate successful renovation practices, including ESCO solutions, to other parts of the public sector and to private clients.

Article 19 about the removal of barriers to energy efficiency in accounting rules and **Article 20** on maximising the benefits of multiple financing schemes can also benefit the EPC market. Finally, the requirements to set national energy saving targets and present National Energy Efficiency Plans are also

⁴ It is possible to introduce alternative policy measures.

expected to indirectly relate to the development of energy services, and a tool for market stakeholders to see more clearly the legal environment and long term goals and commitments of national governments.

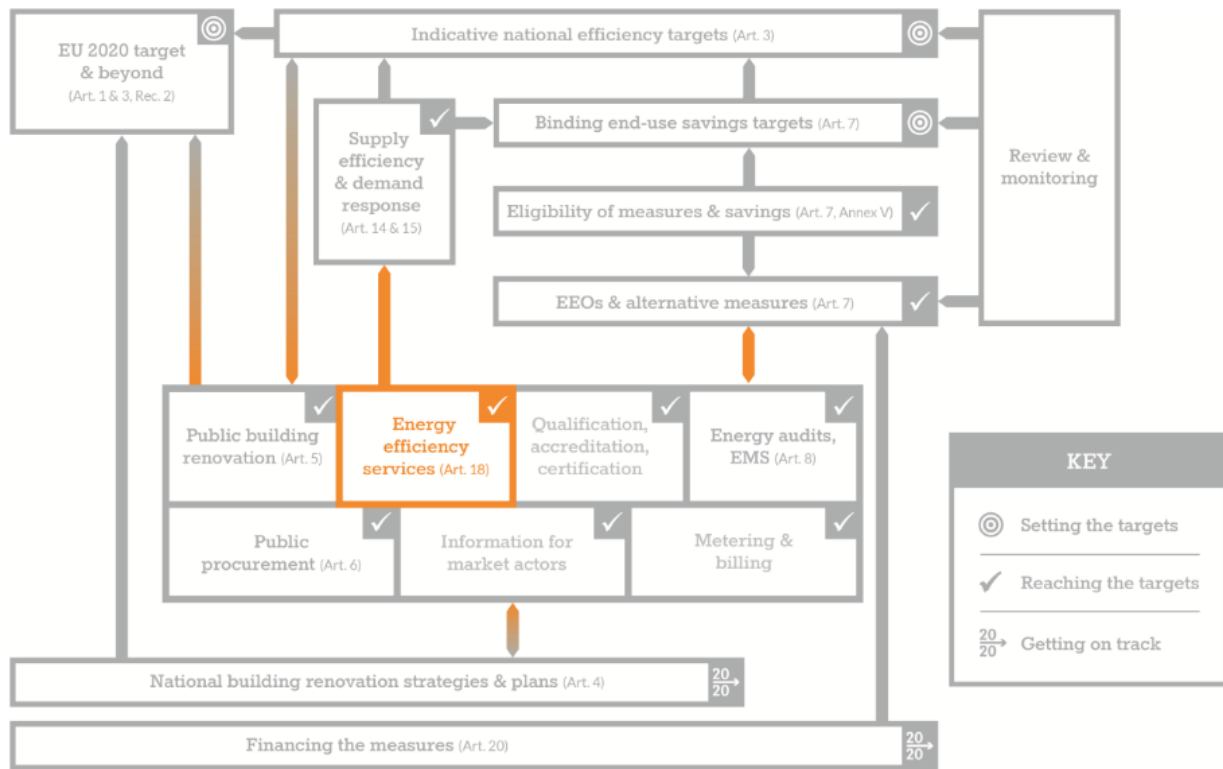


Figure 2. The relationships amongst the articles of the EED. Arrows indicate the links related to the stimulation of energy services. Source: The Coalition for Energy Savings (2013).

The EED follows from the **Directive on End-use Efficiency & Energy Services**, or in short the Energy Services Directive (2006/32/EC), which was also a step in the obligation of Member States to promote energy services. It includes – among others – an indicative energy savings target for the Member States, obligations on the public sector to lead by example in making use of energy services and energy efficient procurement, and measures to vitalize energy efficiency and energy services. Chapter III is about the promotion of energy services, and in particular, according to Art. 6. Member States must ensure that energy companies “refrain from any activities that might impede the demand for and delivery of energy services and other energy efficiency improvement measures, or hinder the development of markets for energy services and other energy efficiency improvement measures”. Provisions under the Energy Services Directive were an important starting point for the EED; however, they have not resulted in unlocking the full potential of savings that could be offered if energy services were widely used. Therefore, a focus on both supply and demand of energy services, including other actors as companies, was necessary and recognised by the European Commission when putting forward its proposal for the EED (The Coalition for Energy Savings 2013).

On 19 May 2010, the EU adopted the **Energy Performance of Buildings Directive 2010/31/EU (EPBD)** which is currently the main legislative instrument to reduce the energy consumption of buildings. Most of the requirements under this Directive are able to contribute to the increase of the ESCO market through promoting an energy efficient building stock and related public measures. Nevertheless the most relevant is **Article 11** on Energy Performance Certificates, which has been found to be an

important driver of ESCO contracts (see national chapters), by showing building owners a list of measures to be implemented to improve their buildings, thus increasing a demand for energy efficiency measures, while reducing transaction costs through mandating energy consumption information collection.

The **European standard EN 15900:2010** defines energy efficiency services (EES) as an agreed task or tasks designed to lead to an energy efficiency improvement and other agreed performance criteria. According to EN 15900:2010 EES shall include an energy audit (identification and selection of actions) as well as the implementation of actions and the measurement and verification of energy savings. A documented description of the proposed or agreed framework for the actions and the follow-up procedure shall be provided. The improvement of energy efficiency shall be measured and verified over a contractually defined period of time through contractually agreed methods. A core element of each EES is thus an energy efficiency improvement (EEI) action, which is any action that directly leads to a reduction in energy consumption. EEI actions may be the substitution of technology, improvement of technology, better use of technology, and behavioural change.

EU programmes and other measures

The **EU Energy Performance Contracting Campaign (EPCC)** runs since 2012 as one of the key activities of DG Energy of the EU Commission. The aim of the campaign is to enable country-specific discussion and capacity building of core stakeholders. The campaign is to strengthen the use of EPC, combining it with energy planning and understanding its role in the implementation of SEAPs as part of the Covenant of Mayors⁵. The campaign is carried out in the light of the EED to support its provisions related to the EPC concept (Petersen 2013).

The campaign consists of targeted capacity building seminars which are organised in various locations across the EU. Furthermore, training materials, guidance documents and best practice examples are made available and shared. The campaign was progressively rolled out at the national level (in cooperation with EPEC), regional level (through the ManagEnergy Initiative) and local level (via the Covenant of Mayors).

The **Covenant of Mayors (CoM)** is “the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and the use of renewable energy sources on their territories”⁶. When an authority signs for the CoM, they commit to reach (or exceed) the EU 20% CO₂ reduction target by 2020. The CoM signatories have to submit a Sustainable Energy Action Plan (SEAP) and report about its implementation. Promoting the ESCO market can be chosen as a key action to be able to reach these targets.

Intelligent Energy Europe has funded a large number of projects to vitalize Energy Performance Contracting. Most of these have targeted the use of EPC in the public sector. Projects such as **Eurocontract**⁷ produced documents and guides, proposed innovative financing alternatives, quality standards, and explored the link between White Certificates and EPC. The projects **Esoli**⁸, **E-street**⁹, and

⁵ see more about the campaign at http://managenergy.net/focus_on_09_2012_2nd.html, http://ec.europa.eu/energy/efficiency/financing/campaign_en.htm and http://www.eumayors.eu/news_en.html?id_news=415

⁶ http://www.covenantofmayors.eu/index_en.html

⁷ <http://www.european-energy-service-initiative.net/francais/eu/toolbox/eurocontract-toolbox.html>

⁸ <http://www.esoli.org/>

Butk¹⁰, helped municipalities switch to energy efficient lighting technologies in the frame of innovative energy services contracting. The FRESH project¹¹ explored the use of EPC for low energy refurbishment on a large scale for social housing.

The **European Energy Service Initiative (EESI)** project¹² made use of previously existing standards and tools for EPC and other energy services, which had been developed in earlier European projects such as ClearContract and Eurocontract. EESI organized local and regional capacity-building through national online-help desks, frequent training events for local authorities, companies, and multipliers, as well as consultancy for applying and advancing EPC-standard procedures and instruments in concrete pilot projects. They established the “European Energy Service Award”. The **ChangeBest** project¹³ aimed at the intensification of the energy efficiency service market through country analyses, experience exchange, general strategy concepts and bilateral dialogues with individual companies on their business plans and product developments.

PERMANENT and CombinES projects were focused on pieces of the energy services contracting, in particular the measurement and verification of savings, as well as on financing. The **PERMANENT**¹⁴ project dealt primarily with TPF in the new European Member States. Its aim was to enhance the rate of investment in energy savings projects by addressing the lack of trust through the development and testing of harmonized and integrated approaches for end users to measure and verify their energy savings, based on instruments used by the Efficiency Valuation Organisation (EVO). The **CombinES project**¹⁵ was organised to maximize energy savings through effectively defining and interconnecting activities of public subsidy programmes with the implementation of energy services.

There are two major projects currently running under the IEE programme, namely, EESI2020 and Transparens. The **European Energy Service Initiative towards the EU 2020 energy saving targets (EESI2020)**¹⁶ is a project addressing the EU 20% energy saving objective by a significantly broader use of EPC. This project is a continuation of the activities of EESI by supporting large cities and metropolitan regions integrate long-lasting EPC implementation schemes in their energy plans. The EESI2020 will result in pilot projects and the training of project facilitators. Finally, the **Transparens** project¹⁷ is to increase the transparency and trustworthiness of Energy Performance Contracting markets throughout Europe. For this result, the project is developing a European Code of Conduct, assists in the establishment of ESCO associations in the partner countries, where this was deemed necessary or proactive, and will provide trainings for the various market stakeholders.

Financing

The **multi-annual Financial Framework** is an important source for funding EPC policies and measures (Petersen 2013). The funds distributed have been and will be available for leveraging private funds for – among others – ESCO markets. Structural and Cohesion Funds have been used for energy efficiency and

⁹ <http://www.e-streetlight.com/>

¹⁰ http://www.elcfed.org/2_projects_kyoto.html

¹¹ Financing energy Refurbishment for Social Housing (FRESH): see more at <http://www.fresh-project.eu/project/>

¹² <http://www.european-energy-service-initiative.net/francais/eu/project.html>

¹³ <http://www.changebest.eu/>

¹⁴ Performance Risk Management for Energy efficiency projects through Training: see more at http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1888

¹⁵ <http://www.combines-ce.eu/>

¹⁶ <http://eesi2020.eu/>

¹⁷ <http://www.transparens.eu/eu/home/welcome-to-transparens-project>

ESCO investments in several countries. The new framework (2014-2020) is in line with EU 2020 strategy for “smart, sustainable and inclusive growth”, and therefore has been designed to serve as the support of a shift to a competitive low carbon economy.

Funds are available under the Intelligent Energy Europe, **Project Development Assistance (PDA)** structures. The PDA shall support public authorities - regions, cities, municipalities or groupings of those - and public bodies in developing bankable sustainable energy projects. Depending on the type of applicant (authority, investor, financial institution) and the size of the project, applicants can select from a number of competitive grants and funding sources (see Figure 3).



Figure 3. Source: IEE (2013).

While the PDA facilities are targeted at project development, the **EEE-F (European Energy Efficiency Fund)** is a core funding source for ESCO projects and can be used both for project development and investments. The EEE-F can be used for loans, guarantees or equity participation in projects launched by public authorities, public bodies, or ESCO's working on a public contract. The fund is operationally managed by Deutsche Bank.

The **EIB** has been active lately with supporting ESCO projects through providing guarantees. The availability and easy access to a financial guarantee is probably more important than providing pure financial grants for EPC/ESCO projects. The benefit lies in the fact that a guarantee fund is able to

mobilize market based investments and thus leverage private funding, and it does not compete with ESCO investments, but rather increases trust and secures projects.

JESSICA is a financial mechanism created in 2006 by the EIB. It allows Member States to mobilize grants from European Structural Funds in order to capitalize funds dedicated to urban development investments, or to conserve returns/receipts generated from the investments or return them to the managing authorities for reinvestment in other urban regeneration projects. JESSICA Funds can be used either as equity, debt or guarantee investment (Milin et al. 2011).

Methodology

The current report, the *EU ESCO status report 2013* builds on an online survey combined and complemented with personal and phone interviews. Information was also collected from national reports, scientific articles, legal documents, and grey literature.

The principal methodology of the research was based on stakeholder information and large-scale surveying of ESCOs, international and national ESCO experts and experts in related fields, academia, and financial institutions. Using the snow-ball technique, interviewees were asked for further contacts who were then also contacted. The questionnaire was based on the surveys used for the *European ESCO Update Report 2007* and *2010*, and the link to the survey was emailed to potential informants. After analysing the survey results, drafts were sent out to the same and further experts and business representatives, who provided valuable comments. The list of informants who sacrificed time and unparalleled knowledge for the compilation of the country reviews is indicated at the end of the report, and the authors express their greatest gratitude to them.

The field research on the EU-28 countries other European countries was carried out mainly between December 2012-June 2013 (online survey), and during November-December 2013 (interviews and comments). Around 300 informative answers were received, close to 200 from the European Union Member States. This indicates that in average at least 2-3, but in most of the countries 8-12 expert answers are integrated for a single country report. While the survey can be considered as very successful with a large amount of new information gathered, the authors encountered difficulties in collecting sufficiently detailed information in some countries, and results may therefore be biased. To overcome this handicap, literature, reports, governmental archives, and project documents were consulted to verify the information gathered. In spite of the extensive efforts of the authors to produce a correct overview of the situation, any comments, constructive critique or feedback is appreciated in order to be able to improve the information presented herein.

Limitations

The authors found that information was often hard to access, hidden, non-existent or available only on the local language; therefore in case of certain countries the descriptions are less detailed than in others.

It has also been found that comparison of ESCO markets at a European level is limited by the fact that ESCO offers differ from country to country. ESCOs may be focused more on providing a full scale service from project preparation and auditing till monitoring or they may provide only part(s) of the value chain. They may be required to offer full guarantees or may be used as project managers. They are considered as financial alternatives (in Estonia, Hungary), or as organisers/managers (Denmark), or establish strong

long-term and often renewed partnerships (in France). In spite of the existing and well-received common definition offered by the EU legislation the notion of “Energy Service Company” may still mean a variety of similar businesses. All in all, the authors of this report experienced that the local definitions have converged much since the first report in 2005, and it is much easier to talk about the ESCO market and share experiences among countries.

It is particularly difficult to compare numerical feature, such as number of companies, size and potential of markets because local studies, if existent obviously focused on local need of information in the locally most appropriate and/or traditional form (e.g. yearly vs. cumulated values, market size in terms of containing construction costs/preparation/transaction costs/considering energy saving values, being expressed in terms of monetary value, energy savings, etc.). Available values are thus not freely comparable. To overcome this problem, the authors always indicate the available information about the more precise content of these numerical values.

How to read

Structure of the report

The rest of this report is organised as follows. After a short review of the finding of the *European ESCO Status Report 2010* on ESCOs in Europe, country specific short papers follow that cover the development of national ESCO markets between 2010 and 2013. This is the main body of this report. The final part makes a summary of data and information on the individual ESCO markets, and a list of common and most important barriers and success factors.

Structure of the country chapters

The country chapters provide a short description of the national ESCO market history and key features. Then the portrayal of the market features between 2010 and 2013 is depicted, with information on the number and type of companies, the size of the market and its energy saving potential, and the institutional framework, namely facilitators and associations. In the next sub-chapters key factors (mainly drivers) are discussed from a regulatory, market, financial and informational point of view. This is followed by a section on the most important barriers. The review of barriers may occasionally return to the description of new aspects of some factors already showed in the previous sections, if factors are two-sided, and for example, a regulatory change has both positive and negative consequences.

How to read the figures

In most of the chapters, there is a comparative graph about barrier types that are generally characteristic of ESCO markets. The factors are evaluated between being an important problem (outside) that limits the development and expansion of the given market or it is not relevant (inside) in the context. Thus, in a country where there is no ESCO specific legislation, however the lack of which does not hinder the ESCO market development because the general regulatory framework is supportive, the “no ESCO regulation” point will lie towards the center of the graph. In this case, the lack of ESCO legislation is not a main barrier. The value of the factors is only relative and was produced as a qualitative summary of the survey and interview respondents, as well as based on literature. Therefore it should not be translated to numbers.

At the end of every chapter there is a spider-web chart, where a few selected important factors are evaluated qualitatively. The level of development of the given ESCO market is on top of this graph, and is shown with a red circle. This assessment is again relative, and indicates a comparison amongst the

reviewed countries based on the number and type of ESCOs, the volume of projects, the recent developments, etc. It reflects a kind of “championship” rather than hard core quantitative features (e.g. market size), which are not yet comparable at an international level due to the limitations already discussed above.

Finally, the key features of the markets are provided in a table, reflecting the structure of the previous EC JRC reports.

The list of respondents can be found at the end of the report, as well as the questionnaire that was used for the online survey.

ESCO markets until 2010

The development undergone by the countries between 2007 and 2010 vary significantly, but some trends were identified for groups of countries:

1. The knowledge of the “ESCO concept” increased, where potential clients started to consider energy efficiency services more as business as usual. The **awareness and understanding of energy efficiency services** increased and mistrust decreased. These were based on the growing importance of energy consumption cost efficiency due to rising energy prices and growing “environmental awareness”. Financial institutions also acquired more experience. For instance in France, higher importance was given to third part financing than before.
2. Although the European Energy Service Directive (2006/32/EC) aimed at removing restrictive **public procurement rules that** conflict with ESCOs, public procurement rules and evaluation criteria in the public tendering process remained the main barrier for ESCO project development in the public sector. Nevertheless, several countries were identified in 2010 that showed significant improvement. For instance in Spain, until October 2007 when the new national procurement law was approved, procedures were not adapted to long term service contracts. With the entry into force of this law, public contract are limited only to 20 years. In Greece the Public-Private-Partnership law 3389/2005 allowed a public institution to employ a private body to operate and manage the building energy services infrastructure as opposed to before. The Energy Efficiency Agreements 2008-2016 in Finland are aimed at ensuring that municipalities are able to use ESCO services when implementing energy efficiency investments. In fact, plans were introduced to identify and remove obstacles in the municipalities’ administration and decision-making procedure restricting the introduction to ESCOs.
3. As imposed by the Energy Service Directive (2006/32/EC), the **public authorities** got **increasingly active in supporting the development of an ESCO market** in some countries. Public authorities in Spain prepared an ESCO model contract, opened credit lines and prepared calls for tender to implement energy services in public buildings. In Sweden, to spur EPC projects, the Swedish Energy Agency (STEM) was pursuing a “portfolio of flexible mechanisms” which included the formation of an ESCO network, customer oriented information, guidelines for the procurement process, model contracts, EU-IEE projects, and project evaluations.
4. The **financial crisis and economic downturn** had important positive and negative impacts on the initiation and development of ESCO projects which in some cases counterbalanced each other on the same market. The economic downturn made ESCO clients more unstable due to the reduced activity increasing the difficulty in ensuring energy savings and raising the risk of insolvency. The

economic downturn had also raised the importance of resilience, raising the desire in clients of stipulating more flexible contracts. On the other hand, the financial crisis and economic restrictions had increased the attraction of achieving cost reductions through energy efficiency measures and taking advantage of the flexible financing mechanisms offered by ESCOs (such as third part financing and shared savings).

5. The ESCO market in a number of countries had not undergone **major market development** between 2007 and 2010. In particular, the ESCO market did not change in the larger part of the New Member States.

Countries, such as –Turkey and Ukraine – emerged from their embryonic state in 2007. Turkey's ESCO market grew from having no ESCO activity in 2007 to 5 registered energy consultant companies and 33 organizations waiting to be registered in 2010. Ukraine grew from 3 ESCOs in 2007 to 30 small local companies active in conducting energy audit, energy consulting, information services and project management for energy efficiency projects 2009. Countries where the ESCO market saw a significant growth were Sweden, Italy, Spain and Denmark.

The following barriers were identified in 2010 as common in several European countries:

1. The **legislative framework, including the public procurement rules**: including the tendering process and limitations on the contract. Furthermore, complexity of the processes and selection practices caused problems. The model was not recognised by a number of authorities.
2. The **international accounting rules**: which could restrict financing opportunities.
3. The **low and fluctuating energy prices**
4. The **financial crisis and economic downturn** causing **difficulties in accessing financing**.
5. The **high perceived business and technical risk** in relation to the following issues:
 - the perceived risk that the energy efficiency interventions might compromise the core business related process;
 - the competition of energy efficiency investments with core business related investments;
 - the aversion to outsource energy management;
 - the lack of flexibility and long commitment with ESCO contracts.
6. The **mistrust related to the lack of standardization**:
 - inhomogeneous ESCO offer;
 - lack of competition;
 - lack of experience of clients, ESCOs and financial institutions;
 - absence of credible and visible reference cases with a clear client focus;
 - unclear definitions and failed contracts;
 - unstandardized measurements and verifications;
 - complex and non standardized contracts.

Mistrust was also identified from the side of contractors towards clients, due to an increased risk of unstable and insolvent customers. Furthermore, partnerships between the ESCOs and subcontractors were marred as a result of financial difficulties of the construction sector in general, whereas many previously reliable companies went bankrupt or had change business.

7. Collaboration, commitment and cultural clashes

The following success factors were identified in 2010 as common in several European countries:

The number of policies and dedicated actions set up with the objective of directly growing the ESCO market were limited. However a number of legislative, structural and market related changes were revealed as enabling factors by producing an indirect effect on the demand for energy efficiency services and their implementation.

- 1. Steady growth of energy price, partially due to rising energy taxes**
- 2. The liberalisation of the energy markets** had been underway since the last decade and it was considered an important enabling factor in order to create the right market conditions for ESCOs to emerge.
- 3. Structural and market related changes**, such as the change in mindset towards the outsourcing of services such as energy management and public building facilities management.
4. The normal refurbishment and modernisation needs (especially in the buildings sector)
- 5. Environmental awareness and related politics**
- 6. The establishment of ESCO associations** combined with standardization efforts, dissemination of information and capacity buildings, lobbying.

Description of individual markets

European Union Member States

Austrian ESCO market 2013

The Austrian ESCO market, and in particular the EPC market is considered as well developed. It emerged in the mid-1990s, exhibiting a decent market development since its start, but slowing down in recent years. The first key advancement took place in 1998, when two building pools with around 50 federal buildings (Viennese schools) were renovated by ESCOs under the “Performance Contracting Project”. These were followed by regional projects, particularly in Styria, Salzburg and Tyrol. In 2001, the decision of the Council of Ministers launched a large-scale renovation project of approximately 500 buildings using performance contracting, under a plan called “Contracting Offensive” (AEA 2007).

Current ESCO market

As of 2013, over 1800 buildings¹⁸ have been renovated using the ESCO model, and mostly EPC (Lamers, Kuhn, and Krechting 2008; EC JRC 2012). Typically, ESCO projects in Austria have been carried out in bundled pools of public buildings. Tenders continue to be announced, nevertheless the previously running large-scale programmes have not been repeated, and thus the expansion of the ESCO market has stopped (EC JRC 2012)..

There are over 50 ESCOs (including supply contractors), and about 10-20 of them offer strictly EPC. Companies largely have local ownership and most ESCOs are small or medium sized enterprises, who mostly deal with energy services as their core business (EC JRC 2012). Lately, utility companies are also involved in the ESCO market (EC JRC 2012).

As of 2010, the size of the Austrian ESCO market was estimated to be around €15-20 million annual investments, referring to only the EPC sector (and not to supply contracting) (EC JRC 2012). Currently this market volume seems to be decreasing. The total market potential is unknown.

After successful projects in the public sector, the ESCO concept should be extended to the private sector. While, success remains limited, there are some good examples.



The overall management and control system optimization of the office building of the O.Ö. Insurance-AG was realized through EPC. The value of the investment was around €150,000, which yields €30,523 guaranteed electricity cost savings per year. This corresponds to 23.8% savings.
Source: OÖ Energiesparverband (n.d.)

¹⁸ The estimated total number varies between sources, but 1800 buildings seems to be a reliable average.

An ESCO association, the Association of Austrian Energy Contractors¹⁹, was established in 2005. There are a few other important facilitators, such as energy agencies and consultancies.

Types of projects

The federal governments remain to be the main ESCO clients. Austria has run extensive renovation programs for public buildings through contracting (AEA 2011), but these have come to a halt (EC JRC 2012). According to the first National Energy Efficiency Action Plan (NEEAP), there were plans to continue these renovation programmes until 2015 (AEA 2007), however this has not been carried out or translated into real measures and ESCO successes are still limited geographically. Therefore the concept has not spread throughout the country.(EC JRC 2012). Some recent national renovation programmes have been carried out by a partnership of the state property company "Bundesimmobiliengesellschaft m.b.H." (BIG), the Federal Ministry for Agriculture, Forestry, Environment and Water Management (BMLFUW) and the Federal Ministry for Trade, Industry and Labour (BMWA)²⁰, but these were limited in numbers.

Projects focus mostly on space heating, air conditioning, lighting, and building automation. ESCOs aim at projects with short pay-back time, and therefore building envelope is often omitted, although there are positive examples (EC JRC 2012).

In the period between 2006 and 2011, contracting models were further promoted for private sector buildings. While, according to the NEEAPs, Austria had plans to extend EPC even to households (AEA 2011), actual plans and details have not been put forward . The private tertiary sector has a number of additional barriers because buildings are often rented out, and the classical split incentive phenomenon reduces the motivation of the owner and user to invest in energy efficiency. Furthermore, energy consumption is perceived to be of minor issue for private companies, who are hesitant to accept the perceived risks related to renovation, to engage in long-term contracts, and to invest in energy efficiency in general (Lamers, Kuhn, and Krechting 2008).

Regulatory factors

The regulatory environment of ESCOs in Austria is supportive. The most important market movers have been regulatory-informative policies and measures, such as (based on Boonekamp and Vethman (2010)):

- certification and accreditation schemes (such as in the Thermoprofit programme²¹);
- eco-label indicating the quality of ESCO services and their compliance with standards;
- mandatory energy consultation as a prerequisite for subsidies;
- standard contracts developed under the scope of European projects and with the involvement of market facilitators.

There are some regions with legal specificities that make them more attractive for ESCO projects, including:

- stronger building standards than the national building codes;
- obligatory audits for public buildings;
- mandatory energy efficiency criteria for certain products in public procurement.

¹⁹ Dachverband Energiecontracting Austria, see at: <http://www.contracting-portal.at/show.php>

²⁰ See examples at: www.contracting-portal.at and www.big.at/umwelt-soziales/contracting (Bundes-Contracting)

²¹ www.thermoprofit.at and <http://www.managenergy.net/download/nr199.pdf>

Market factors

As mentioned above, the market has been primarily demand-side driven. Nevertheless the establishment of a working market was a result of large-scale national and federal programs. Lately, the activity of these programmes have stopped or decrease, and therefore the market will be required to run on its own..

ESCOs may have been successful in the public sector because of the established trust, part of which was due to the quality certification and standard contracts combined with support and advice in the establishment of contracts.

The function of facilitators has been highlighted (Bleyl et al. 2013). Energy agencies and consultants were important in ensuring a high, but fair competition, which is crucial in the establishment of a working ESCO market. These actors have been able to contribute to project initiation through helping the clients' decision making directly (through e.g. advice) or indirectly (quality labels, project awards). Bleyl et al. (2013) suggest that facilitators will be crucial in the future of the Austrian (and other) market(s) to help the clients (and sometimes the ESCOs) deal with the complexity and technical-nature of the ESCO offers in a more open, less regulated and demand-driven market. Facilitators participate in the selection of the project and suppliers, as well as during implementation, monitoring and verification. These facilitators can ease communication between partners, close the cultural gap between them.

Awareness and trust

Austria has several local energy agencies that are active in energy efficiency promotion, and have a tradition in the provision of advice to energy efficiency customers (AEA 2011).

While demonstration and dissemination of best examples seems to be successful within the public sector, diffusion to other areas remains limited in spite of dedicated efforts. In particular, a voluntary agreement scheme to provide audits has resulted in more than 200,000 energy advice services provided to households and more than 300 energy audits at enterprises (AEA 2011). Although these audits could have been used as the basis for ESCO projects (whereas the available audits could save up-front costs), they did not launch an ESCO boom. Federal states have been also active in the provision of advice either for free or at a subsidised cost. Indeed, these activities may have been competing with energy service offers instead of supporting them.

Financing ESCO projects

There are no problems with availability of financing (EC JRC 2012), and public building projects typically apply a shared savings ESCO model, whereas 80% of the calculated savings go towards the financing of the construction measures, and 20% go to the user of the building. Commercial banks are ready to engage in ESCO financing (EC JRC 2012).

Large financial support is available for energy audits at national and federal state level. Also in Austria energy efficiency vouchers are provided to SMEs to cover up to 90% of the cost of energy audits since 2008. The audits should be encouraged to be used more extensively, including in ESCO projects.

Barriers

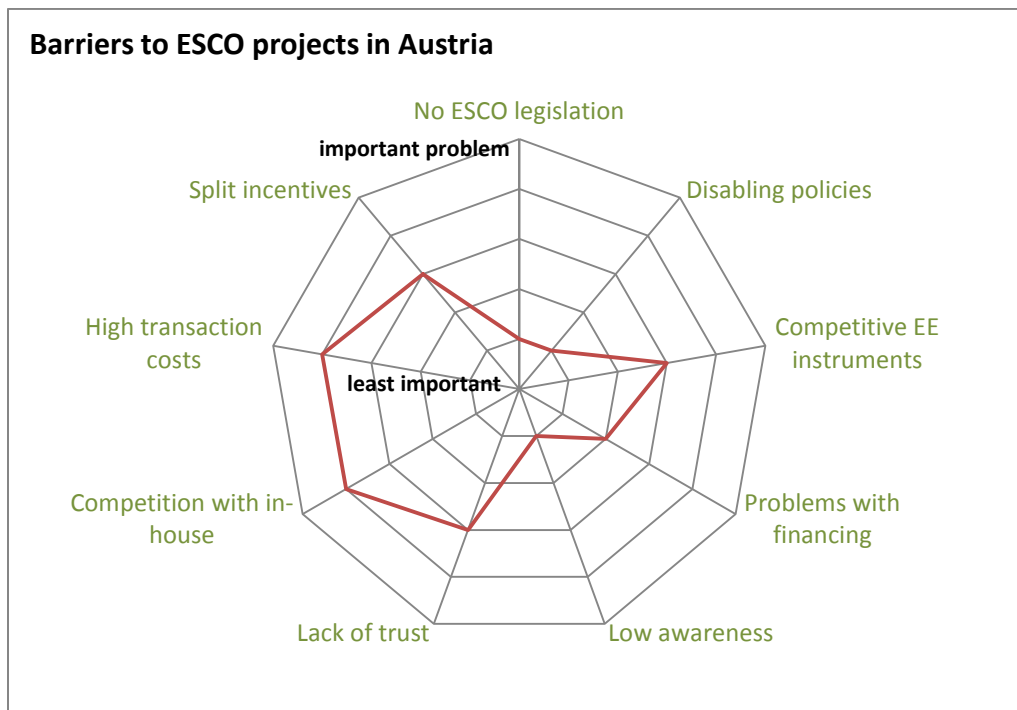
Most of the regular barriers have been overcome or have small importance in Austria, according to the survey (EC JRC 2012). This is particularly true for the public sector clients, where the core obstacle to

ESCO projects is the existing in-house expertise (EC JRC 2012). Furthermore, the expansion of ESCOs is limited on a pure market basis because of the focus on short pay-back time, and thus ignoring opportunities with deep retrofit or building envelop and other new targets (EC JRC 2012).

Subsidised audits and optimisation programs (e.g. parts of Klima:aktiv programme) could be encouraged to provide a fruitful basis for ESCO projects, however currently they are thought to be competitive to the ESCO market (Boonekamp and Vethman 2010).

Other, general barriers are valid for the private sector, in particular, high transaction costs, small project sizes, perceived risks and lack of best practice examples.

In summary, the following graph illustrates the relative importance of barriers in Austria:



Conclusions and future expectations

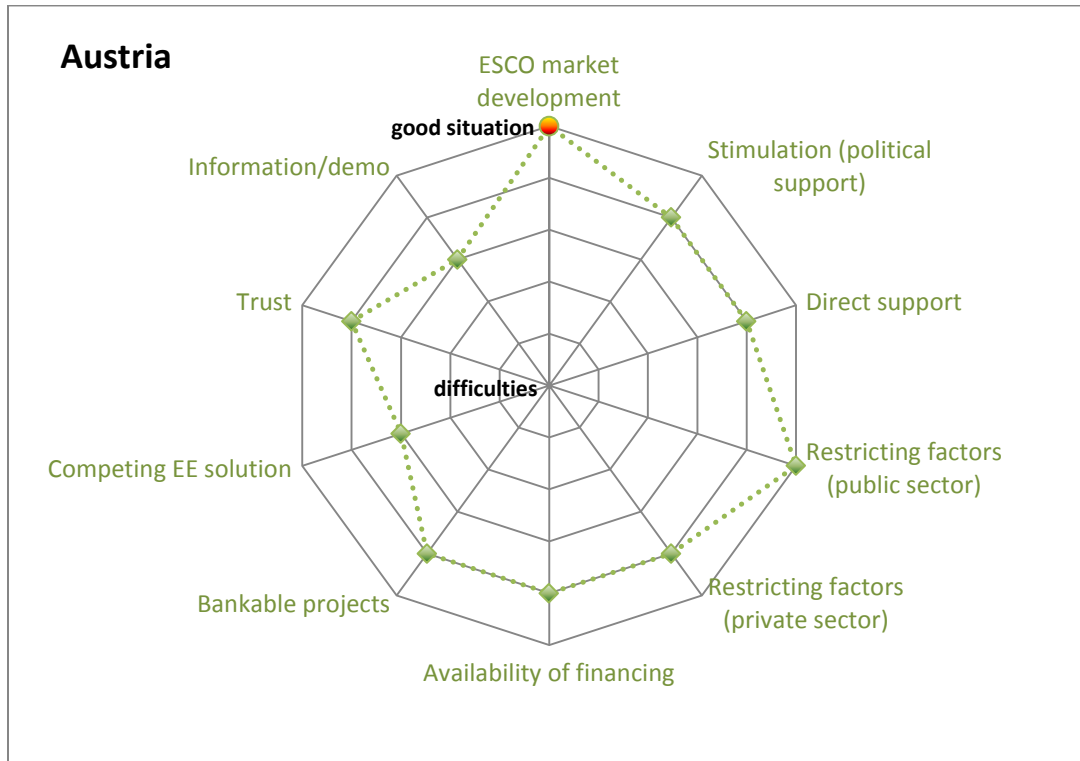
The Austrian ESCO market has been one Europe's showcases from several perspectives. Market growth was rapid for a period (mid 1990s-2010) due to a number of large programmes driven by the client side, mainly the federal governments. Policies and programmes have been successful in creating framework for trust, competition and demand for improved energy efficiency within a short time. In recent years growth has stopped due to the decrease in federal programmes and the Austrian market has halted. So far, the introduction of the ESCO concept in the private sector has not been successful..

Key drivers

- Governmental leadership and support at national and federal level;
- Facilitators;
- Bundling of projects, thus economies of scale;
- Dissemination of success examples;
- Quality labels for ESCO and their services.

The Energy Services Directive and the Energy Efficiency Directives have been indicated as important in future development,. Survey respondents believe that further EU policies, for instance mandatory renovation rates could further improve the ESCO market. In the absence or reduction of large national and federal programmes, it is unclear whether the Austrian market will be able to keep up its pace on a market basis. The legislative background is given, experience is available, but these have to be kept up-to-date. Facilitators could provide the necessary market push.

The following graph shows the key features of the Austrian market:



Austria in a snap-shot:

Number of ESCOs	>50, of which 10-20 offer EPC
ESCO market size and potential	market size: €15-20 million annual investments market potential: unknown
ESCO market trend	halted, after a decent growth until ca. 2010
ESCO association	'Dachverband Energiecontracting Austria' (Professional Association for Energy Contracting)
Typical ESCO projects	space heating, air conditioning, control and automation, lighting. Building envelope projects increasing Public sector buildings
Main type of contract	EPC, shared savings model

Belgian ESCO market 2013

A stable and slowly growing, though moderately sized ESCO market was repeatedly identified in Belgium by previous JRC reports (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010), which continues to be largely based on the public ESCO, Fedesco. This situation has not changed much during 2010-2013.

Current ESCO market

The number of ESCO companies remains largely unchanged (EC JRC 2012), centred around 10-15 firms, of which 6 are large (daughter companies of large international firms), 5-7 are small and medium sized (EC JRC 2012). This compares to a non-existent ESCO market in 2005 (Coolen 2009; Federal Public Service of Economy and Energy et al. 2011). Furthermore there are four public ESCOs: Fedesco²², created in 2005, provides ESCO services to federal public administrations and organizations. The Flemish government founded the Flemish Energy Company (VEB)²³ in early 2012 to provide energy services for Flemish public administrations and organisations.

The distribution grid operators for gas and electricity in Flanders created ESCO departments to offer services to cities, municipalities and provinces in their operating area: EDLB (Energy Services for Municipalities) was opened in 2010 by Eandis, whereas Infrac established Infrac ESCO around the same time, driven by regulatory schemes that define energy services as a public service obligation. VEB started with a capital of 200 million (although only a limited part of this is allocated to the ESCO activities) but still has to launch its first projects. Fedesco has a capital of 6,5 million financing capacity with state guarantee of 150 million euro and invested about 30 million euros in projects (studies and investments). Infrac ESCO has engaged 8,6 million euro in studies (186 feasibility studies and 32 detailed studies) and 4,2 million euro investments (covering 30 ongoing projects)²⁴. The public ESCO model used by

Fedesco, Infrac and Eandis has been referred to as an “integrating” organisation²⁵, contracting public entities directly, and then subcontracting the tasks to smaller, private suppliers on a competitive basis. This has included framework contracts with engineering companies and equipment installation companies or general contractors. (EC JRC 2012)

Fedesco has moved to becoming more of a “facilitating” organisation for Energy Performance Contracts, with the federal Building Agency contracting directly with the private ESCO partner. A Management Contract, signed between the federal government and Fedesco in 2013 clearly titles EPC as the way forward for the federal buildings. The first project was started in 2011 with 11 federal public buildings,

Fedesco's experience confirms that the average payback time of energy saving projects as of 2012 is very short, slightly over 2 years.



Merksplas Prison. Source: www.fedesco.be

Fedesco was monitoring 45 of its projects (including relighting, HVAC modernization, etc.) since 2007. These projects required altogether a total investment of almost €2.5 million, resulting in almost €2 million worth energy savings to date, and a further cost saving of over €1.1 million annually. This reflects a 2.25 years of average payback time. Source: Fedesco (2012)

²² Fedesco is the Belgian Federal authorities' energy services company and third party investor. For further information visit: www.fedesco.be.

²³ Vlaams Energiebedrijf

²⁴ status in March 2013

²⁵ Singh et al. (2010) have applied the term “super ESCO”.

using the innovative methodology of Energy, Maintenance, Comfort and Building Value Performance Contracting, referred to as smartEPC, developed by Belgian experts. The “multi performance model” of this new model has extended the classical EPC project to non-energy benefits, including comfort, maintenance and building value performance. The smartEPC is set to become a standard for EPC projects in a significant part of the public sector. VEB has also announced its intention to use the EPC model from the start (Vanstraelen 2012).

There are two associations that are relevant for the energy services market. BELESCO²⁶, created in 2010, is the Belgian association of ESCOs and energy service providers and the AGORIA GreenBuilding platform²⁷ is a group of energy service providers within the Belgian Federation of Industrial Companies. BELESCO also includes other stakeholders such as consultants and project facilitators, engineering companies and banks.

The current market size is estimated to be around €1-5 million for EPC contracts (EC JRC 2012), but the potential is projected to be extra-large, between €500million and several billion based on the saving potential and in case of opening the public sector for the large-scale application of EPC.

Types of projects

There were almost no ESCO projects in Belgium before 2005²⁸, except for a few unsuccessful attempts in the 1990s and some preliminary service provision activity without performance or financial guarantees (Federal Public Service of Economy and Energy et al. 2011).

Today Energy Performance Contracting is still rare, but the market is expected to kick-start due to the increasing awareness and activity in the public sector, as well as due to the promotion by facilitators (Vanstraelen 2012).

ESCO projects are concluded in the public sector, and aspirations are rarely focused elsewhere. Main targets are healthcare facilities, educational and office buildings (EC JRC 2012). It was estimated that around 20 projects were running in 2011 by private initiative and ownership (Federal Public Service of Economy and Energy et al. 2011), however more up-to-date information is not available.

ESCO projects are concluded mainly in the public sector, although long project set up delays have motivated some ESCOs to move forward to the private sector. Main targets are healthcare facilities, educational and office buildings (EC JRC 2012).

Private ESCO's also exist in the public sector, nevertheless they are more active in private buildings and industry, with some success. At the same time, significant growth of the ESCO market is likely to come mainly from EPC or ESC projects being put in the market by the public ESCOs and facilitators, confirming the need for public ESCOs and project facilitators to accompany public building owners in the future (Bleyl et al. 2013). Smaller ESCOs have done some smaller projects, either in Energy Supply Contracting (ESC), “EPC light”, “shared profits”, “No cure, no pay” or “shared savings” models, both with public and private building owners.

²⁶ <http://www.belesco.be/about-belesco>

²⁷ <http://www.agoria.be>

²⁸ when Fedesco was established

Regulatory factors

There is a considerable lack of legislative focus on the ESCO market. Main regulatory provisions that can advance the ESCO market include the establishment and funding of public ESCOs, information campaigns, the obligation to employ energy managers and mobility officers, etc. (Federal Public Service of Economy and Energy et al. 2011).

There is a need for clearer accounting and public budgeting rules concerning ESCOs, EPC and provision of energy services in Belgium. VAT rules for public ESCOs are subject to interpretation, while experience with public tenders is limited (Berliner Energieagentur GmbH 2012a). On the positive side, legal and public tendering rules have been defined, in accordance with Belgian tendering law, including “negotiated procedure” and “competitive dialogue”. Because of well established standard contracts, defining functional and performance specifications, the negotiated procedure is most common (EC JRC 2012).

Although there has been some interest, there is little or no real activity at the level of the Wallonia and Brussels regions, mainly because of lack of policy support or public initiatives for energy services in general and EPC in particular. The exception is at the provincial level with the Province of Walloon Brabant having initiated a large EPC project for up to 30 sites (150 buildings). This is expected to be launched in 2014. (EC JRC 2012)

The energy efficiency obligations in Flanders have probably contributed to the activities in the ESCO market, but the impact is unknown and the link is not as straightforward as in other countries (such as Denmark, Poland). The system is (now) based on action obligations, as opposed to target obligations before, which limits its applicability to ESCO projects. The obligated parties are the electricity distributors and the certificates are not traded, which again restricts the scheme’s relevance to ESCOs (The Regulatory Assistance Project 2012).

Market factors

The Belgian ESCO market is mainly driven by the efforts of the public ESCOs that act as market facilitators (EC JRC 2012), ESCO project facilitators and aggregators of projects, and the impact of actual market forces are limited. Only few projects are initiated solely with private participants or contractors. It is nevertheless, expected that a market based development will be achieved when the market size reaches a threshold and public entities will look for energy services on their own (EC JRC 2012). An increase in the number of private consultants and ESCO project facilitators from 2 in 2010 to 5 in 2013 has also increased the capacity for market stimulation (EC JRC 2012).

Awareness and trust

The political and implementation frameworks are fragmented in Belgium due to the federal set-up of the country, which requires extra promotional efforts from the side of contractors to disseminate their successes (Berliner Energieagentur GmbH 2012a).

Fedesco is responsible for general awareness raising and promotion of energy efficiency and energy services in the public sector in cooperation with the Federal Buildings Agency at the federal level. At non-federal level Fedesco created its “Knowledgecenter” for energy services and third party financing in 2010. Fedesco is able to offer know-how transfer, consultancy, training and contracting assistance (or project facilitation) to local, provincial and regional public entities and other public building owners (EC JRC 2012), including small-scale analyses, identification and benchmarking of potential buildings, as well

as full monitoring of the technical stages of an ESCO project (Federal Public Service of Economy and Energy et al. 2011). Fedesco outsources significant amounts of expertise to private facilitators and consultancy companies (EC JRC 2012)

The activity of the “Knowledgecenter” led to at least two large cities and one province to be engaged in EPC pilot projects²⁹, showing the risk of carrying projects beyond legislative terms. (EC JRC 2012)

Following the requirements to evolve towards Near Zero Energy buildings, the Flemish Energy Agency³⁰ has asked the Flemish Business Agency³¹ to coordinate actions to support energy services, ESCO projects and third party financing in the private tertiary sector and in industry. This shall include promoting energy services to small and medium sized companies, through support and subsidies for strategic consulting and coaching. (EC JRC 2012)

Financing ESCO projects

Public ESCOs provide a basis for Third Party Financing practices, because they are able to supply an advance payment (Federal Public Service of Economy and Energy et al. 2011). They handle a serious amount of budget that should be spent on energy performance improvement, often in the form of a revolving fund.

The financial crisis has affected the ESCO market from the side of the clients, because municipalities’ budgets or budget lines have been frozen, and their limits to take debt have been restricted. Studies in search for innovative solutions are currently under way (EC JRC 2012)

Fedesco is working on the analysis for the creation of a new legal entity which will have to be a full-fledge energy-services company with the ability to deliver services related to the whole value chain, including financing solutions, to both public and eventually private clients. This future structure is likely to be a PPP entity (jointly owned by the public shareholder and a public partner), through which the public shareholder keeps control on the way the clients are served. In particular, the public shareholder would be able to impose specific objectives in terms of serving the public clients (e.g., CO₂ emission reduction objectives at public clients). The new structure will have to ensure that the financial liabilities related its activities will not be consolidated with the public debt. (EC JRC 2012)

Barriers

While the development and structure of the Belgian ESCO market is very unique, and further advancement is seen and expected in the future, there are a number of barriers that may hinder a smooth development.

Key problems lie with the policy support especially at the regional level for EPC and the fragmentation of the legislative frameworks. Ambiguities in the rules increase transaction costs, and may cause difficulties in project implementation and even limit the interest from potential clients. This is added to the lack of reliable knowledge of many building owners, and may result in a natural apprehension from the complexity of the EPC concept. In parallel, there is limited human capacity at the administration that

²⁹ although one city also abandoned its EPC pilot project after a change in local political majority after the municipal elections in 2012

³⁰ Vlaams Energieagentschap or VEA

³¹ Agentschap Ondernemen or AO

could manage and supervise energy efficiency projects in-house. These culminate in a major lack of trust by potential clients.

A specific Belgian ESCO barrier is the competition with applying the classical methods of individual energy efficiency projects, rather than EPC based projects, whereas ESCOs act as integrators rather than as facilitators (Coolen 2009; Bleyl et al. 2013; EC JRC 2012). While there have been numerous projects by now, many run without EPC/guarantee. It is also problematic that these examples are largely successful due to the public support involvement. It is expected that these public ESCO projects will mature, and the market will move towards EPC (EC JRC 2012). While there is significant financial support through public ESCOs, combined with continuous awareness raising, clear definition of ESCOs and requirements for guarantees in the ESCO projects are missing. The government should develop a standard tender/quotation request³² in order to enable EPC projects and their selection of energy efficiency criteria instead of simple maintenance contracts selected based on the lowest price criteria (EC JRC 2012). Clearer accounting and public budgeting rules concerning ESCOs, EPC and provision of energy services would be necessary. VAT rules for public ESCOs are subject to interpretation resulting in difficulties for project implementation. As for the private sector, there is a lack of successful demonstration (EC JRC 2012). Facilitation could be a solution for many of the above barriers (EC JRC 2012; Bleyl et al. 2013).

In summary, the following graph illustrates the relative importance of barriers in Belgium:



³² cahier des charges

Conclusions and future expectations

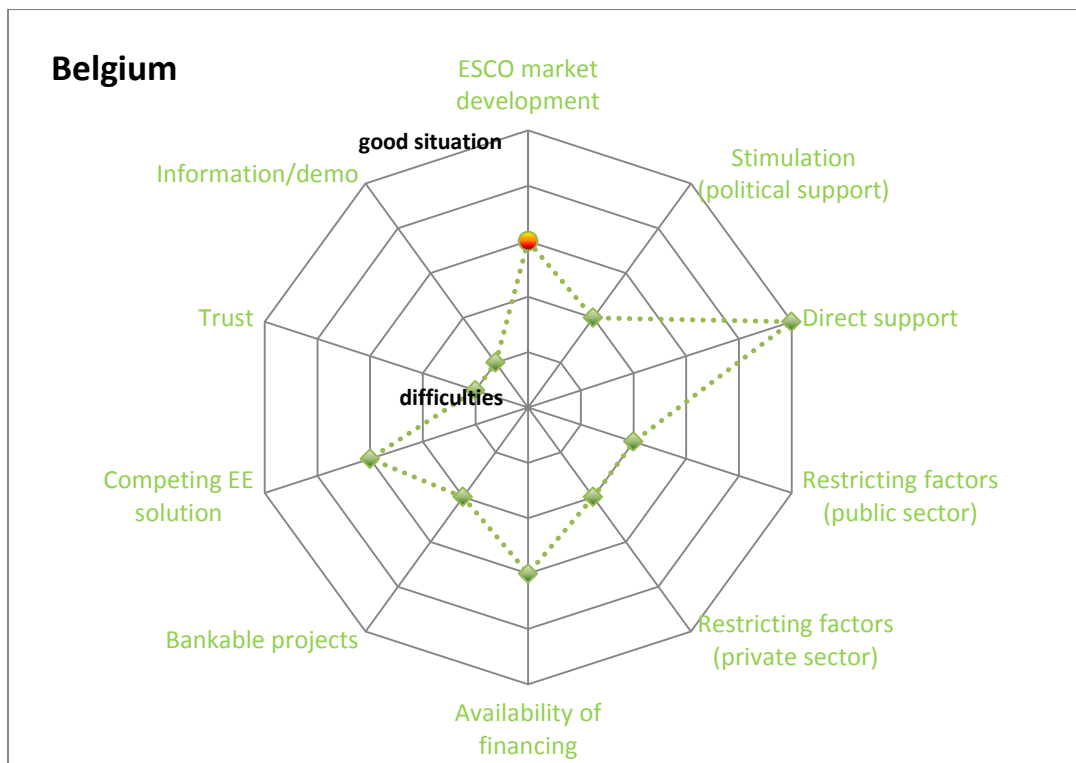
Experts expect that the Belgian ESCO market is just in front of a tipping point. It has been slowly extending and developing its structure during recent years. The activities of public ESCOs are considered to be successful, and they have taken up the roles of facilitators. Further promotion and demonstration will be a key in expanding towards the private building sector, who are hoped to follow a learning curve from the public sector. Increasing trust e.g. through the help of facilitators has been a successful way forward.

The ESD and EED are considered as drivers of the ESCO market in Belgium. According to experts, further EU obligations, procurement rule changes, taxation rebates and rules, and especially demonstration projects would be necessary to move the market ahead (EC JRC 2012).

Key drivers

- Public support through public ESCOs;
- Financial support in the form of revolving funds and public ESCOs;
- Awareness raising activities by public ESCOs and European projects (EESI, ChangeBest);
- European directives.

The following graph shows the key features of the Belgian market:



Belgium in a snap-shot:

Number of ESCOs	4 public ESCOs and 10-15 private firms (6 large, 5-7 SMEs)
ESCO market size and potential	<i>market size:</i> €1-5 million turnover <i>market potential:</i> €500-1000 million
ESCO market trend	slow growth
ESCO association	BELESCO: the Belgian association of ESCOs and energy service providers and AGORIA GreenBuilding platform
Typical ESCO projects	public sector buildings private industry facilities
Main type of contract	public energy service contracts without guarantees EPC and SmartEPC (Energy, Maintenance, Comfort & Building Value Performance Contract)

Bulgarian ESCO market 2013

In spite of the particularly high energy saving potentials³³ and rather advanced legislative framework for energy efficiency, the ESCO market has still not found its way off the ground. A small ESCO market has been alive since 2000, mainly nurturing on the support, technical assistance and credit lines brought to the country by international organisations (such as the EBRD, World Bank, UNDP, USAID, etc.). While there are active companies with successful projects that could be replicated, the market has not yet seen a breakthrough.

Current ESCO market

The number of ESCOs in Bulgaria is uncertain, because there is no official register in Bulgaria.

There are about 50 companies that could offer energy efficiency services, but experts estimate between 7 and 12 active EPC companies (EC JRC 2012). Based on the above, Bulgaria experiences a slow increase of the number of interested companies (from 12 in 2007 and ca. 20 in 2010 (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010)). Most of the active companies are national firms (EC JRC 2012; Khamrakulova 2013). The main business interest of EPC companies lies with engineering, facility management, equipment provision, consultation and energy supply. They offer energy efficiency services in addition to their main businesses (EC JRC 2012).

First EPC in Bulgaria, 2001

Sofia Municipality outsourced the management of the thermal systems of 309 of its buildings because of the lack of in-house personnel. The contractor was selected through a restricted procedure, and was required to operate the thermal systems for 7 years and implement measures through EPC (shared savings model) resulting in >25% energy savings while keeping the normative comfort. The project used the internal funds of the ESCO and bank loans.

Finally, 50 GWh annual energy savings (30% of original consumption and corresponding to 90,000 tCO₂) were achieved, which corresponded to nearly €8.5 million. The biggest challenges were the low quality information used for the establishment of the baseline and the lack of experience in EPC.

Source: Radulov (2012)

³³ energy intensity was 4.8 times greater than the EU average in 2010 and is likely to remain 4.9 times more energy intensive than the EU average in 2020 (EPEC 2013)

The market potential is estimated to be €500-900 million by the survey respondents, though a reliable and official market size assessment is not available (EC JRC 2012).

There is no ESCO association to represent these ESCO companies, but many ESCOs and energy companies are members of the Bulgarian WEC Committee³⁴, which operates as an association in certain respect.

Types of projects

The Bulgarian ESCO market is very small, and activity has been targeted at the public sector, with only few projects in the private sector and industry. During the last decade, about 15-20 energy performance contracts have been concluded by the four most active ESCOs, resulting in the refurbishment of over 300 public buildings and the modernisation of the lighting systems of 2 municipalities (EC JRC 2012). However, according to the 2nd National Energy Efficiency Action Plan (NEEAP) of Bulgaria, the government expects energy savings implemented by ESCOs also in the domestic and industrial sectors (Republic of Bulgaria 2011).

Regulatory factors

There is a relatively well established and modern energy efficiency primary legislation in Bulgaria (Khamrakulova 2013), which is not an obstacle for the ESCO market (EC JRC 2012). The core regulatory element that is relevant to the ESCO market is the Energy Efficiency Act of 2004, which (among other provisions) requires mandatory audits for large buildings and most industrial enterprises, as well as sets out the rules and registries for energy auditors, who are also entitled to carry out ESCO services (Boonekamp and Vethman 2010). This was preceded by the National Energy Strategy (in 2002, but later revised) that puts forward the conditions for market mechanisms (Khamrakulova 2013). Energy saving obligations are directly imposed on SMEs above a certain threshold of energy consumption, which may have a positive effect on energy services, but this link has not been properly shown yet.

There is room for improvement to transform the developed but rather indifferent regulatory background into a supportive one, through secondary legislation and dedicated mechanisms. There are ambiguities that should be removed by additional by-laws (EPEC 2013). Experts miss direct incentives (financial and regulatory), improved metering and statistics and an overall contribution to the decrease of unnecessary transaction costs (EC JRC 2012).

In order to assist the market movement towards more EPC investments, the EBRD is launching a programme in 2014 that would entail intensive information dissemination about EPC, investigation of the legislative background, in particular procurement regulations and practices, as well as the general enabling framework and secondary legislation. The programme is to be particularly inclusive, with a strong focus on discussions with key local stakeholders, trainings, development of model contracts and tendering demonstration (EC JRC 2012).

The Bulgarian market has not picked up market based ESCO services yet on a competitive basis, but depends on support. ESCO projects are typically aided with subsidies and other non-market factors.

³⁴ <http://www.wec-bulgaria.org/index.html>

Awareness and trust

There is a need to spread knowledge and experience about ESCOs and EPC in Bulgaria. The limited experience does not yet provide a sufficient level of trust, which is considered as one of the key barriers (EC JRC 2012). Other problems (see below) may undermine already established partnerships, and therefore it is crucially important to deal with the few basic obstacles, such as lack of data, reliable statistics, etc.

Financing ESCO projects

A total of €1.5 billion has been spent on programmes targeted at energy efficiency improvements since 2004 (EPEC 2013). There have been national initiatives as well as a number of credit lines by international funds. There is a possibility to use certain credit lines as a co-financing in technically well-designed, market based projects which yield considerable energy savings or other benefits. There are however others, where eligibility conditions either exclude ESCO participants (and so the financial instrument is not available for EPC investments), or on the other hand, there are too generous sources, where monitoring and requirement per the provable results is not taken seriously. These latter resources distort the market and compete with market based, thus profitable and professional projects. (EC JRC 2012).

The EBRD has been particularly active in the field of EPC support, providing loans to market facilitators, such as the Bulgaria's Fund for Energy and Energy Savings (BEEF) and to private ESCO investments. These loans should be used in turnkey investments for the improvement of the industrial and public sectors including kindergartens, schools, hospitals and other municipal buildings. EBRD has provided funding for Bulgarian banks, too, in order to establish the basis for third-party financing (EC JRC 2012).

The Bulgarian Energy Efficiency and Renewable Resources Fund (EERSF) was established in 2004 with grants from the World Bank and the Austrian government among others and further capitalisation is under discussion currently (EPEC 2013).

Particularly interesting is the significant support to public sector EPC market. The state budget takes over payments in an ESCO project from the participating public entity. If a municipality applies for this programme, the Ministry of Finance (after confirmation from the Sustainable Energy Development Agency) will confirm the expenses for the current energy consumption for the entire project duration.

Unfortunately financial programmes were usually not linked with systematic evaluation of their effectiveness, efficiency and impact, and it would be desirable to integrate monitoring in future programmes. These diverse initiatives are not always coordinated and optimally designed, which may result in overlaps and underuse and should be improved (EPEC 2013; EC JRC 2012).

Barriers

In spite of the favourable regulatory and financial environment, procedural problems make the Bulgarian market almost impermeable for ESCOs. The construction sector is on the ground and has not been able to revive after the crisis. Accordingly any related business, such as ESCOs experience problems.

The state of the buildings and industrial sites in Bulgaria is alarming, and would need urgent renovation. This problem has been discussed on many fora, including previous JRC reports (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010), but has not changed lately. Comfort levels and living conditions are

under average, streets are underilluminated, buildings are underheated. Therefore investments, including ESCO investments, are diluted by the necessary improvement of basic conditions. This is detrimental to the profitability/payback time of an ESCO project: initial savings must go into the normalisation of the situation, i.e. to the establishment of a normalized baseline according to the current regulations. In these circumstances a guaranteed savings agreement cannot be drawn between the ESCO and the client, because there might not be cost savings in the end.

Collecting data and establishment of the baseline data is also problematic and costly. Available statistics are of poor quality, metering practices and technology are underdeveloped and there is a lack of building level information, which directly increases transaction costs to a level that is hardly compatible with a normal ESCO offer. Alternatively, some ESCOs engage in projects without the availability of proper knowledge of baseline, which increases risks and/or costs.

The above barriers result in a tainted partnership if the client is not willing to acknowledge that these additional costs (which may even reduce the financial benefits to zero or to negative) do not form part of the actual ESCO project. When this is not clarified before the project, trust in the ESCO market can seriously deteriorate.

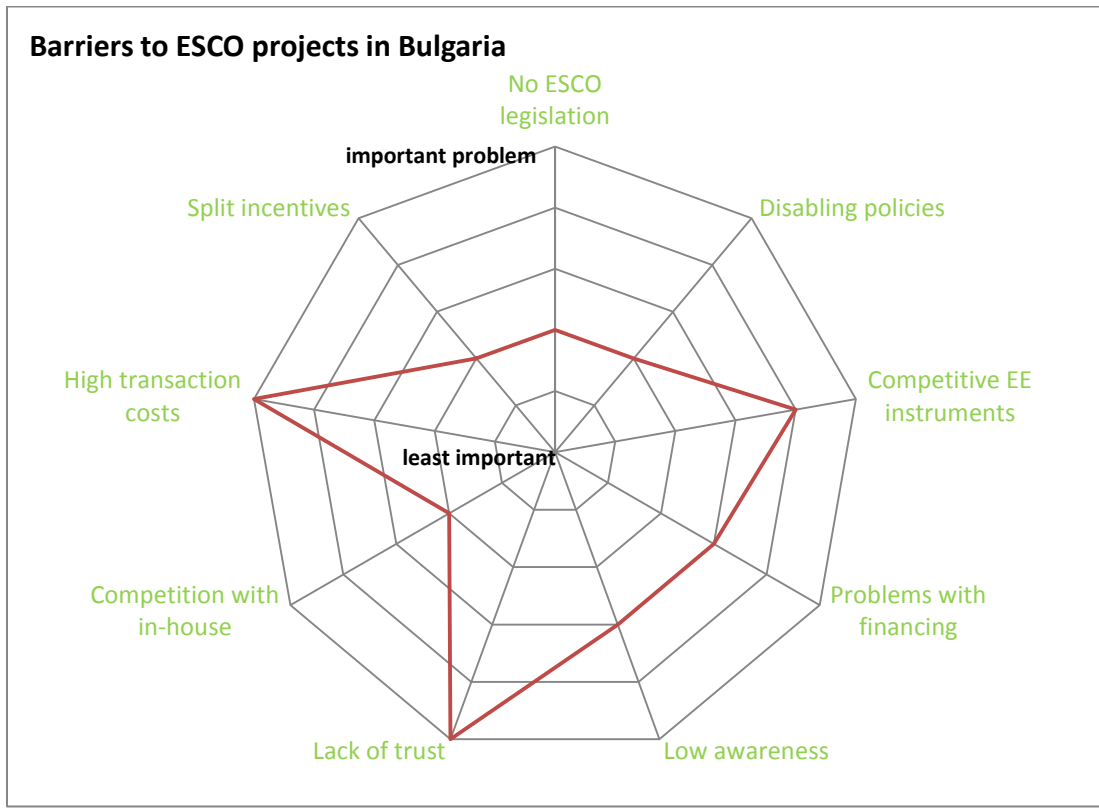
The required payback period (5-7 years) is short (Khamrakulova 2013), and limits the usability of the ESCO solution – especially when taking into account the above conditions, too. Transaction costs and difficulties related to the necessary clarifications for financing ESCO projects discourage potential participants.

Payback period is also affected by the low energy prices.

As described above, financial instruments and funds can be helpful by softening credits and increasing the profitability of a project. On the other hand grants or credit lines that are given away too generously, without scrutinized monitoring and strict requirements will be used by non-effective projects, too, and will compete with EPC suppliers (EC JRC 2012). Furthermore, projects that fail to deliver the expected energy savings may dissatisfy clients and reduce trust in the market.

Finally, awareness raising of the essence and benefits of EPC and third party financing in its various forms remains an important task. However, this alone could not induce a major leap in the ESCO market development. Furthermore, in itself awareness raising cannot be successful, without a critical mass of successful examples to serve as illustration and challenge.

In summary, the following graph illustrates the relative importance of barriers in Bulgaria:



Conclusions and future expectations

Barriers in Bulgaria are still overpowering and do not allow the establishment of a commercially viable ESCO market. ESCO projects do not prove to be profitable without external grants, while commercial banks are not open for alternative financing mechanisms (EC JRC 2012). The problem with profitability originates from the obsolete state of buildings and sites. A normalization of living conditions (in particular proper heating and lighting), ideally even combined with energy renovation, is pressing. A good start would be the creation of building statistics and a metering system according to EU norms.

ESCO projects may incorporate normal renovation elements, however this should be clearly set between the client and the contractor, because the cost of the improvement of basic conditions often melt down the income from energy efficiency investments. Alternatively, dedicated programmes for the improvement of the state of the buildings, sites and streets are imperative.

The revival of the building industry is also a necessary condition for the proper functioning of the ESCO market.

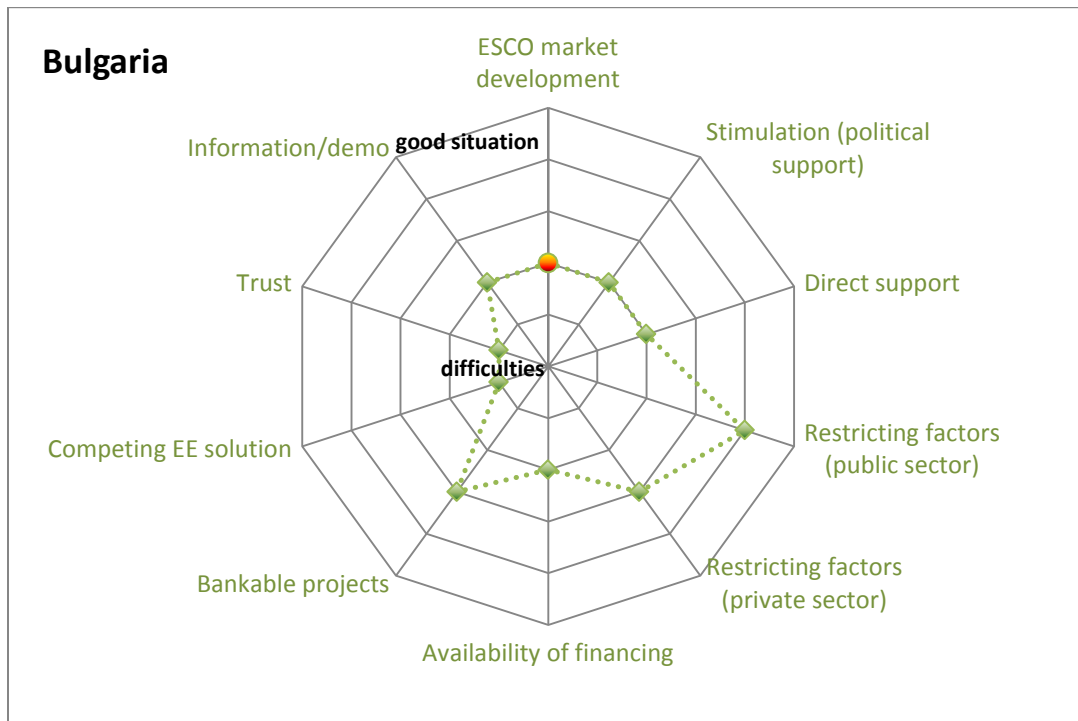
While the ESD and EED are considered as important for ESCOs in general, no regulatory or financial mechanisms are seen as successful in promoting the Bulgarian ESCO market (EC JRC 2012). Further EU and national legislation would be needed according to experts. Energy efficiency obligations increase the need and benefits of ESCOs, and White Certificates – that are being considered in Bulgaria – may be an important support factor in the future (EC JRC 2012). The development of reliable M&V protocols will be needed for both systems (Giakoumi and Markogiannakis 2010).

At the moment, Bulgarian ESCO market enjoys a number of alternative financing mechanisms. Those that are combined with strict technical requirements and monitoring are key factors in the assistance for the market. Overtaking EPC expenses from municipalities by the state budget is exemplary.

Necessary changes to start-up the market

- Normalisation of the state of the buildings, living conditions, illumination level to a level mandated by regulation;
- Establishment of statistics, data collection and information about buildings;
- Development of building level metering;
- Awareness raising activities;
- White Certificates.

The following graph shows the key features of the Bulgarian market:



Bulgaria in a snap-shot:

Number of ESCOs	ca. 50 companies offer ESCO services, of which about 7-12 operate currently
ESCO market size and potential	market potential: €500-900 million
ESCO market trend	stagnation
ESCO association	none
Typical ESCO projects	public sector buildings, public lighting
Main type of contract	energy supply contracts, some EPC (guaranteeing is difficult)

Croatian ESCO market 2013

The first ESCO in Croatia (HEP ESCO) was established by the World Bank and the Global Environmental Facility (GEF) in 2003 in the framework of the Energy Efficiency Project Croatia. By 2009, another small ESCOs was present in addition, besides a number of companies that occasionally dealt with “ESCO type projects” (Marino et al. 2010). The Croatian market was decreasing during the period 2007-2010 due to the financial crisis and due to a lack of momentum (Marino et al. 2010).

Political support has significantly grown in Croatia since 2012, and while the market did not change much during 2010-2013, a market growth is expected by experts in the near future (EC JRC 2012). HEP ESCO, which still operates as one of the key ESCOs in 2013, is a public company owned by the Croatian utility company HEP³⁵. The core business of HEP ESCO is the development, implementation and financing of ESCO projects in Croatia (EC JRC 2012).

Current ESCO market

As of 2013, In Croatia are active around 10 ESCOs are active in Croatia that can provide energy services, mostly on the basis of energy service contracts with fixed fee. The majority of these firms are small private companies with limited own equity and financial capacities. There is one public company, HEP ESCO (EC JRC 2012), which is also the most dominant on the market.

The Croatian ESCO market is relatively small, and it is estimated to be around €100 million (EC JRC 2012). At the same time, all the sectors have large saving potentials due to the obsolete status of the building sector. In the public sector most of the buildings were constructed in the period 1945- 1990 under the old building codes used before 1987 (EC JRC 2012). The commercial sector and especially the facilities (hotels, shopping malls, camps, etc.) that are situated on the Adriatic coast represent high energy efficiency potential because they are not connected to the gas pipe lines. Here demand side energy efficiency measures can be complemented with the installation of renewable energy technologies, due to the favourable climatic conditions (Ministry of Economy and Ministry of Construction and Physical Planning 2013).

Croatia adopted its second NEEAP in February 2013. Energy services and ESCO are stipulated as one of the models for financing energy efficiency projects in the public sector, as well as in residential and commercial buildings (Ministry of Economy and Ministry of Construction and Physical Planning 2013).

For implementation of the measures related to energy renovation of residential buildings, the second NEEAP (Ministry of Economy and Ministry of Construction and Physical Planning 2013) set an expected energy saving target of 3,554 GWh for 2020, assuming that every year 1% of the building surface will be renovated or approximately 1.5 million m² of residential buildings per year until 2020, which should be realized with an investment volume of €300 million /year. ESCOs are expected to contribute to these savings significantly.

Pursuant to the second NEEAP, the Croatian government will prepare and implement a plan for the energy renovation of public buildings for period 2012 – 2016(2020). Focus has been set on public buildings constructed before 1987 and their renovation in terms of low-energy standards (based on the provisions of the recast EPBD). The assumed renovation volume is around 479.000 m² per year (5% of the total floor area), which is expected to be realized with €96 million/year, to be sourced from IFIs, HBOR, commercial banks, European programmes, as well as through ESCOs (Ministry of Economy and Ministry of Construction and Physical Planning 2013).

The NEEAP measures and the national programme for public buildings renovation are expected to be a main driving force for the development of the ESCO market in Croatia in the near future.

³⁵ Hrvatska Elektorprivreda (HEP) is a Croatian producer and distributor of energy

Types of ESCO projects

The Ministry for Construction and Physical Planning and Ministry of Economy initiated the “Retrofitting programme for public buildings” for the period 04/2012 – 12/2013. The overall objective of the Programme is the implementation of economically feasible measures in 400 targeted sites related to energy efficiency and renewable technologies. Main beneficiaries of programme are users and owners of public buildings as well as energy service providers (engineers, consultants and ESCO companies) and financial institutions. Besides concrete energy savings (0.54 PJ/year), the programme should reinforce the ESCO market and introduce energy efficiency procedures in public procurement (Zeljko 2013). In 2012, pilot projects including the refurbishment of 40 buildings have been initiated through the development of TORs and the publication of public procurement tenders by the Centre for Monitoring Business Activities in the Energy Sector and Investments. The selection of the pilots was based on the following criteria:

- Energy savings costs during the contract period should be higher than the cost of the investment;
- Buildings must have clear ownership structure;
- Buildings that were constructed before 1987 and that have a useful floor area larger than 500m²;
- Audit report has to be prepared for each of the selected buildings.

The most important criterion which is a basis for the realization of the programme is that the fee according to the contract for the energy service has to be lower than the savings on costs for energy carriers (Centre for Monitoring Business Activities in the Energy Sector and Investments 2013).

HEP ESCO has realized more than 50 energy efficiency improvement projects with a total amount of €20 million since its establishment in 2003. The projects’ value is in the range of €100.000 - €2 million. The majority of implemented projects have affected public buildings (41 school buildings, two hospitals and one office building) and they involved the replacement of inefficient windows, insulation of buildings and improvement of heating systems – replacement of old boilers and automatic regulation. The achieved energy savings in schools are in the range of 20-30% of the baseline consumption. Street lighting refurbishment has been carried out in a few municipalities, such as: replacement of light bulbs, replacement of light fixtures and embedding regulation of light beam. The total volume of public street lighting projects was around €6.8 million and achieved savings between 19-47%. HEP ESCO has also implemented few projects in the industrial sector (in particular in food production) as well as in the commercial sector (hotels) (Vlasta 2013).

However, these projects were never based on performance guarantee, but instead offered loan capital only, since the legislation for ESCOs and the relevant public procurement procedures were not yet developed.

Regulatory factors

The Law on the Efficient Utilization of Energy in Final Consumption (adopted in 2008 and reviewed in 2012 OG 158/08 and OG 55/12) is the legal basis for energy services and ESCO operation in Croatia. It defines energy services, energy auditing, and certification of buildings and prescribes obligations for the public sector, energy companies and large consumers.

In addition, there are several by-laws that constitute the energy efficiency policy of Croatia. The most relevant for ESCOs are:

- Regulation on Energy Audits and Energy Certification of Buildings (OG 81/12);
- Regulation on the Methodology for Monitoring, Evaluation and Verification of Energy Savings (OG 77/12); and
- Ordinance for Contracting and Implementation of Energy Services in the Public Sector (OG 69/12).

Pursuant to the Regulation on Energy Audits and Energy Certification of Buildings, energy auditing is mandatory (every five years) for all public buildings (owned or used), as well as for companies with annual consumption exceeding 10.000MWh consumption. The data thus collected can be a good starting point for future ESCO projects. The requirement for energy certification of buildings has been in place in Croatia since 2008 (Ministry of Economy and Ministry of Construction and Physical Planning 2013).

The Ordinance for Contracting and Implementation of Energy services in Public Sector (OG 69/12) created the legal preconditions for the implementation of ESCO model in public sector by enabling EPC in the public sector and setting the conditions for organizing public tendering for energy services. Further relevant provisions are as follows (Zeljko 2013):

- Energy savings are recognized as an income for the building owner;
- Project implementation risks lie with the ESCO companies (investments in energy renovation shall be repaid from the energy cost savings);
- Baseline consumption should be calculated on the basis of energy invoices for last three years.

Market factors

Electricity and natural gas tariffs have been increasing significantly in the last few years (e.g. in 2012 the price for households for electricity was increased by 27.4 % and by natural gas 21%, while electricity tariff for industry increased by 6% and by 7% for natural gas (Eurostat 2013). It shall raise the interest and motivation of the households and industry to invest more in energy efficiency.

Besides market factors, the demand for energy efficiency project solutions have increased in Croatia in the public sector, due to the growth in political will of the government and local authorities. This situation is expected to be a major driving force for the development of the ESCO market in Croatia. Municipalities and Cities recognize the benefit of energy efficiency and many of them prepare local energy action plans (including 46 SEAPs within the framework of the Covenant of Mayors programme until September 2013) and programmes for energy efficiency.

Awareness and trust

Most of the information and public awareness campaigns for energy efficiency have been organized in framework of the project "Removing Barriers to Energy Efficiency in Croatia", running since 2005. For several years now, the project has been implemented by the Ministry of Economy, Ministry of Construction and Physical Planning and the United Nations Development Programme (UNDP Croatia), with financial assistance from the Croatian Environmental Protection and Energy Efficiency Fund, on the other hand the initial six years of the project were co-financed by the GEF. The project focuses on public buildings owned by cities and counties, but also incorporates activities such as national and local information and education campaigns and consulting for households (Cacic 2013).

Financing ESCO projects

The Croatian Environmental Protection and Energy Efficiency Fund offers co-financing for projects, programmes and measures for environmental protection, energy efficiency and renewable energies. It is the first and only extra budgetary foundation that provides incentives for energy efficiency and renewable energies projects. ESCO projects in the public and the private sectors are also eligible.

The Croatian Bank for Reconstruction and Development (HBOR) is a potential source for financing ESCO projects. HBOR already developed a credit programme for the design and preparation of sustainable energy projects through commercial banks (EC JRC 2012).

HBOR also offers preferential loans for up to 14 years to the winners of the tenders under the "Retrofitting programme for public buildings" (see more above). The loans are distributed through the HBOR and financed by European Investment Bank. However, this programme has not been popular with ESCOs because they would have to take loans of 14 years, which is contradictory to their borrowing limitations.

Commercial banks in Croatia are aware of the ESCO model and they are interested in ESCO projects, but they need to learn more about financing of ESCO projects and how to develop financial products for the ESCO market. They require as collateral 30% and more equity from ESCOs, while they also request alternative government guarantees. Multi-years-budgeting is permitted in Croatia, but the approval from the Ministry of Finance is needed for every application. Pursuant to the Ordinance for Contracting and Implementation of Energy Services in Public Sector (OG 69/12) the investments undertaken by ESCOs are not counted any more as public debt for the customer of energy services (EC JRC 2012).

Barriers

The results of tenders in the framework of the first/pilot phase of the "Retrofitting programme for public buildings" showed some of the barriers in practice that constrain the development of the Croatian market for energy services particularly in public sector (Zeljko 2013):

- Lack of well-prepared projects –database for public buildings is incomplete;
- Insufficient number of energy service providers, and even these avoid taking over risks;
- Problems with property rights and ownership of the buildings;
- Verification of energy savings is not ensured.

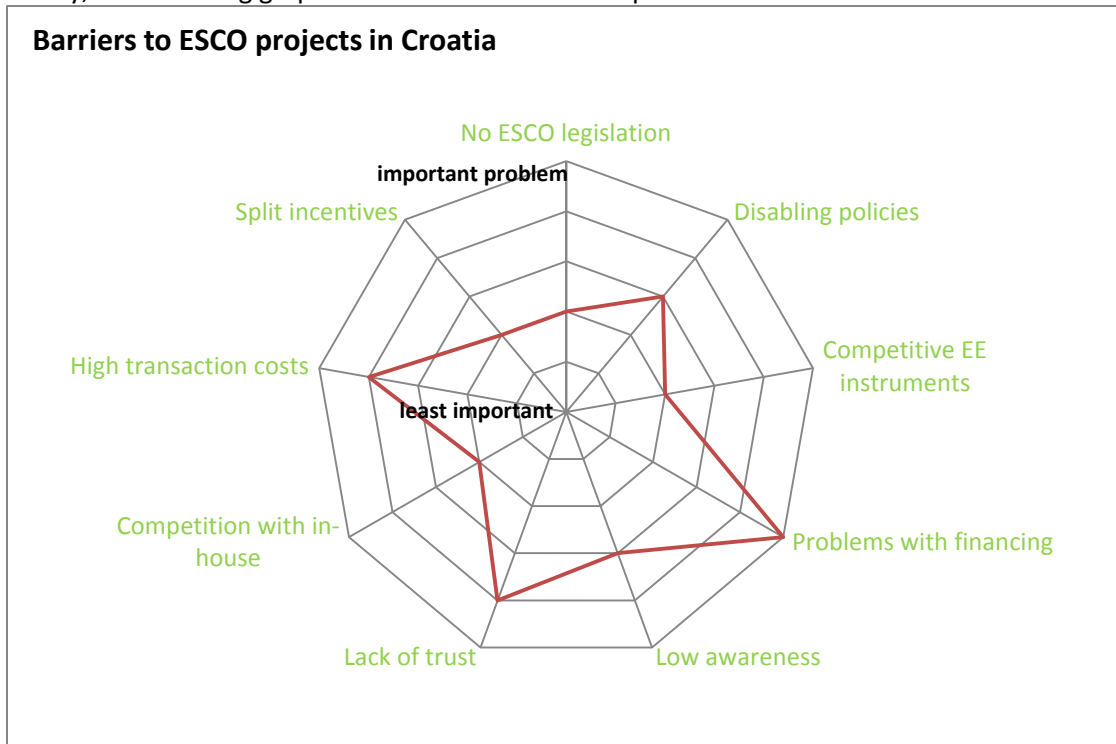
As a result of the above barriers, the Centre for Monitoring Business Activities in the Energy Sector and Investments did not receive offers from energy service companies for 16 tenders relevant to 22 public buildings. Only one tender has been answered by two offers. Learning from these experiences, the Centre published a tender for the energy audit of further 300 buildings in August 2012. Thus in the second phase of the programme 4-6 offers were received for each of the 7 published buildings based on a new tender documentation, as a result of the education and training of clients (Centre for Monitoring Business Activities in the Energy Sector and Investments 2013).

Other barriers that constrain faster development of the Croatian ESCO market are (EC JRC 2012):

- Complexity and inflexibility of public procurement rules;
- The ESCO model is not recognized by the authorities and business sector as an individual business model providing energy services;
- ESCO projects are not profitable without state grants;

- Contractual agreements specific for ESCO projects are often incompatible with contractual regulation and definitions. This might change as a result of the new laws, but no experience has shown it yet;
- Lack of standardized contract model for ESCO services;
- Small size of projects in certain sectors and low priority of energy efficiency investments on the corporate agendas.

In summary, the following graph illustrates the relative importance of barriers in Croatia:



Conclusions and future expectations

The Ordinance for Contracting and Implementation of Energy Services in the Public Sector (adopted in June 2012) and changes in public budget legislation have enabled faster development of ESCO market in Croatia, however experience have not yet shown their real life application and effects. Local authorities (municipalities, cities and counties) are now able to conclude energy contracts based on ESCO model. For a long time there was an issue related to the debt restriction of the local authorities and the Ministry of Finance had considered ESCO contracts as classic public debt. With the new legislation on public budget this barrier will be overcome (EC JRC 2012).

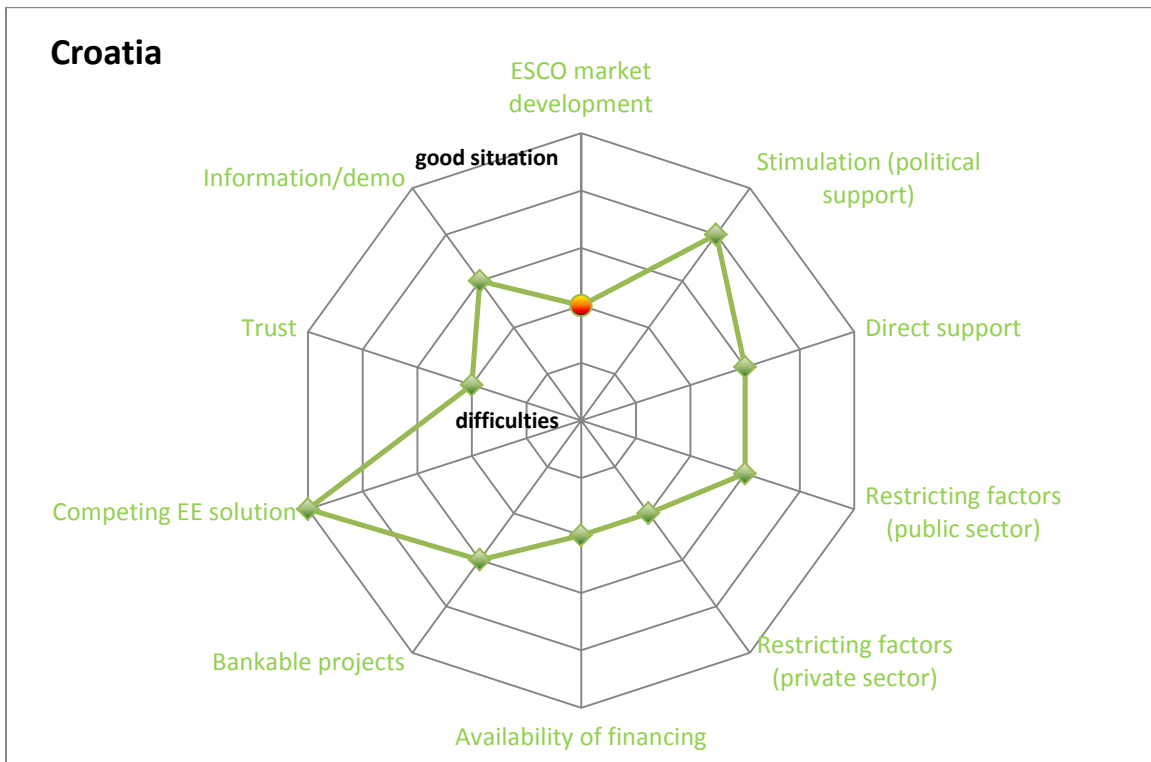
Implementation of the second NEEAP should have important influence on the Croatian ESCO market, since it foresees that energy efficiency measures in the public sector shall be implemented through ESCO projects. However, ESCOs in Croatia still need financial incentives from the state or other public budget because banks are not yet ready to get involved in a way suitable for ESCOs.

Possible break-through points:

- Changes in the legislation, in particular: the Ordinance for Contracting and Implementation of Energy Services in the Public Sector;
- Retrofitting programme for public buildings;
- The Second NEEAP;
- Increased awareness raising activity.

It is expected that the full implementation of the national “Retrofitting programme for public buildings” will stimulate the growth of demand for ESCO services in the public sector, and in other sectors as part of a snowball effect. At the same time, experience gained from public procurement tenders should be used to overcome several other barriers to ESCOs.

The following graph shows the key features of the Croatian market:



Croatia in a snap-shot:

Number of ESCOs	10companies (one public ESCO)
ESCO market size and potential	market size: € 100 million
ESCO market trend	increasing since 2012
ESCO association	none
Typical ESCO projects	refurbishment of building envelope, heating systems and indoor lighting in public buildings; improvement of heating system in public buildings public lighting
Main type of contract	energy service contracts based on fixed fee very few EPC contracts

Cypriot ESCO market 2013

The ESCO market in Cyprus has been described by previous reports as a low-hanging fruit that is not being deployed due to a number of basic barriers (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). This situation has not changed, and – according to the survey respondents – the financial crisis has further reduced the attention paid for energy efficiency (EC JRC 2012).

On the other hand, the workshop organised in the scope of the EU Energy Performance Contracting Campaign (EPCC)³⁶ found that ESCO and EPC can become hot topics in Cyprus in the near future (ManagEnergy and Cyprus Energy Agency 2012).

Current ESCO market

There are no ESCO companies in Cyprus, but according to unofficial data, more than 20 companies are currently interested to become ESCOs (Efthymiou 2012). The first pilot projects are expected to be planned and implemented in 2014 (EC JRC 2012). Subsequently, there is no ESCO association; nevertheless the Cyprus Energy Agency has been active in information dissemination and promotion, including the EPCC campaign.

Types of projects

As part of the implementation of their SEAPs in the context of the Covenant of Mayors and the Islepact programmes, 16 municipalities and communities have joined forces in order to complete a street lighting upgrade with the assistance of the Electricity Authority of Cyprus. The Electricity Authority will act as the ESCO. They are assisted by the Cyprus Energy Agency in the design and implementation of the project. The group has also successfully applied for co-funding from the European Energy Efficiency Fund (EEE-F) (€ 16 million acquired). As a result of the project, there will be 63 000 installations replaced with LED, with expected energy savings of 48% from 2014 to 2025, equivalent to 12-18 GWh per year. In

³⁶ http://ec.europa.eu/energy/efficiency/financing/campaign_en.htm

addition to the energy and cost savings, the project is hoped to be used as a good practice example for other municipalities (Efthymiou 2012).

Another pilot project is on the way concerning the renovation of a number of public buildings. The project will start with the preparation of model tender documents and energy efficiency contracts between public entities and ESCOs, according to the requirements of Article 5 of the Energy Efficiency Directive. The tender documents of the project are expected to be published by September 2014. (EC JRC 2012)

It is believed that these projects will be able to demonstrate the feasibility and applicability of the concept in Cyprus, as well as produce model documents to be used by others in the future. These may finally induce a kick-start of the market (ManagEnergy and Cyprus Energy Agency 2012; EC JRC 2012).

Regulatory factors

Development of a supportive legislative framework is the most important prerequisite for energy efficiency and for an ESCO market development in Cyprus. The saving potential in buildings is high, but little is being done about it given the lack of building standards until 2007 (EC JRC 2012).

A set of legislation has been prepared to regulate the provision of energy services from ESCO and are expected to be voted by the House of Parliament³⁷ (EC JRC 2012; ManagEnergy and Cyprus Energy Agency 2012). The regulations – among others – state the ESCO license will be awarded to a company upon the employment of an energy auditor (EC JRC 2012). The first group of Energy Auditors regarding Buildings were licensed by the end of 2013. They went through the required specialized training and were evaluated by the responsible authority, the Energy Service of the Ministry of Energy Commerce Industry and Tourism (EC JRC 2012).

Market factors

In addition to a high renewable potential, Cyprus seems to be an ideal market for energy efficiency investments mainly due to high saving potentials in both transport and the buildings sectors, combined with Europe's most expensive electricity, and a very low energy security (96% of energy is imported) (ManagEnergy and Cyprus Energy Agency 2012). Nevertheless, energy efficiency has received little attention until now. While ESCOs would be a useful vehicle for delivering a reduction of energy demand, and thus major cost savings, the concept has not been able to start off even in a non-commercial basis (EC JRC 2012).

Financing ESCO projects

One of the main barriers is that commercial banks are not open for innovative financing portfolios yet (EC JRC 2012). As opposed to other starter ESCO markets, International Financing Institutions and other international programmes are not active in Cyprus. A few IEE projects have had Cypriot partners, and currently Cyprus also enjoys the Managenergy promotional programme (EPCC), but no financial mechanisms are available.

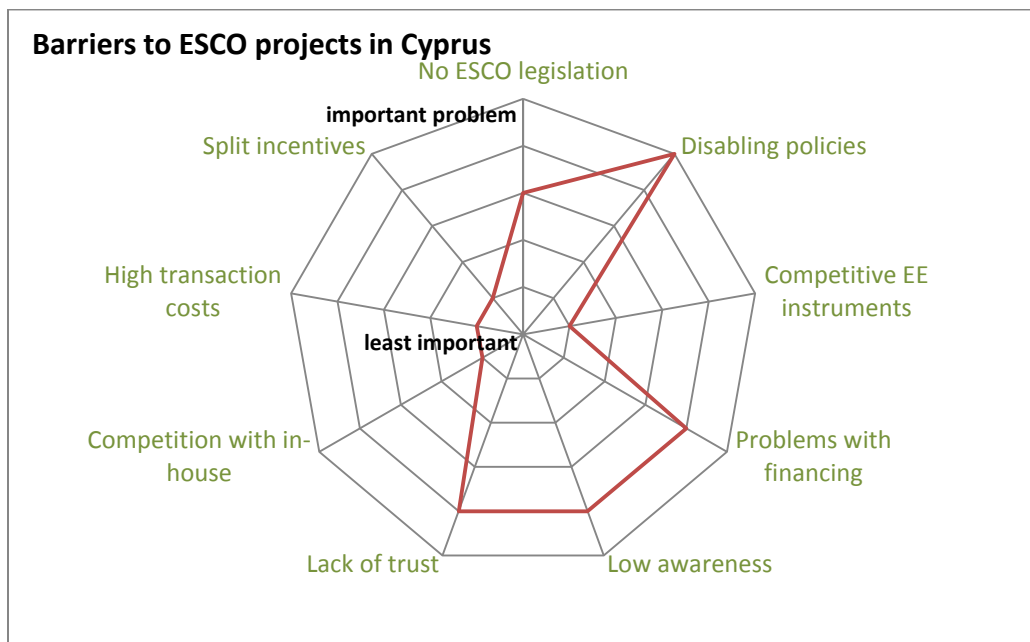
³⁷ See at <http://www.mcit.gov.cy/mcit/mcit.nsf/All/5D6DEF111AE3CF55C22575C5002BFED5?OpenDocument>

Barriers

Cyprus experiences the typical barriers of a beginner market. Main problems lie with the lack of supportive legislation, complex procurement rules that hinder energy efficiency projects, lack of information for companies, potential clients and the financial sector, and thus lack of trust (EC JRC 2012).

Project financing either by the ESCO project partners or by third parties remains to be a key barrier. The problems of the lack trust are expected to be relieved at least partially as a result of the new legislative arrangements on the training and licensing of energy auditors and the adoption of ESCO-related legislation (EC JRC 2012).

In summary, the following graph illustrates the relative importance of barriers in Cyprus:



Conclusions and future expectations

The Cypriot stakeholders are particularly optimistic about a near-future kick-off of the ESCO market. The two pilot projects may become suitable for demonstration and thus prove the feasibility of the concept for local stakeholders. Information dissemination activities will be more credible with this back-up. In addition changes in the legislation, such as licensing ESCOs and the recent developments of building standards are expected to contribute to a supportive environment for a reliable ESCO market. The above changes can contribute to establishing the knowledge about ESCOs and thus a demand, as well as developing trust between potential partners.

Key drivers for a possible kick-start in the near future

- First pilot projects combined with promotion campaigns;
- Very high saving potential in the country, especially in monetary value due to the expensive energy;
- ESCO legislation;
- SEAPs and other local and national targets and energy plans.

According to the survey respondents, further legislation and dedicated measures would be needed, including financial schemes (grants or fiscal tools), and ESCOs could be also capitalized in cities which wish to participate in the Covenant of Mayors and need to achieve ambitious targets in the future.

The following graph shows the key features of the Cypriot market:



Cyprus in a snap-shot:

Number of ESCOs	0
ESCO market size and potential	market size: 0 market potential: N/A
ESCO market trend	stagnation, though first pilot project being organised
ESCO association	none, but for the moment the Cyprus Energy Agency performs some similar role
Typical ESCO projects	the pilot project under organisation will target lighting improvement
Main type of contract	N/A

Czech ESCO market 2013

Considered to be an ESCO success story of the early 2000s due to its impressive takeoff, the Czech energy services market is amongst the most advanced and mature ones in Europe as of 2013. The first ESCO projects took place already in 1993, but the market was given a worthy push around 2001 as a

result of a combination of factors, including marketing by stakeholders and market facilitators, the legislative situation and international financial institutions (Marino et al. 2010; Valentova and Szomolanyiiova 2013).

Current ESCO market

In 2013, the number of companies that are active in EPC implementation is estimated to be around 10, of which between 4 and 7 companies participate in public tenders on a regular basis (EC JRC 2012; Valentova and Szomolanyiiova 2013). This is unchanged since the period of 2007-2009, nevertheless there is a modest market movement behind the figures. Three new local companies were set up, while others had closed during 2010-2013. Further 10 ESCOs offer Energy Contracting, occasionally with EPC features (EC JRC 2012). The market is populated mostly by small local firms, and there are only a few sister-companies of large international ESCOs. There are no public ESCOs in the Czech Republic. (EC JRC 2012)

Most of the companies offer EPC contracting as a supplement to their core activities or as an interesting sales support tool, and experts report that only 1-2 companies concentrate fully on EPC (EC JRC 2012).

Another key player of the ESCO market are consultants or advisors that offer assistance to municipalities and other public building owners in the procurement of EPC services (Permanent project 2012).

Experts' estimates of the Czech ESCO market size vary partially depending on the content of the value, ranging between €10-20 million of annual volume of investments for EPC projects (including construction costs)³⁸ (EC JRC 2012). . The total

investment volume since the start of the ESCO market has been around €120 million (EC JRC 2012). The remaining market potential is estimated to be between €100-500 million for the renovation of public and private buildings, taking into account current limitations and market features. (EC JRC 2012)

There is an ESCO association, the Association of Energy Services Companies of the Czech Republic (APES)³⁹ that carries out promotion of the sector, and has produced an updated standard contract, raises awareness, and has published its Code of Conduct, etc (EC JRC 2012). APES was established in 2011 and has 15 members (Permanent project 2012), most of which are ESCOs, others are ESCO facilitators.

EPC project at the School of Josef Gocar



The school, located in Praha 4, was renovated in 2010 using EPC within a successful energy efficient public tender. The renovation included the reconstruction of the boiler house and air conditioning system, installation of new heat pumps and new regulation system.

Source: <http://www.spsqocar.cz/firmy.php> and Sochor (2013)

³⁸ On the other hand, others shoot at larger values, i.e. between €60-130 million/year for all ESCO type projects, including construction and energy management costs

³⁹ www.apes.cz

Types of projects

Since the start of the ESCO market in the Czech Republic, ca. 150-200 EPC projects have been implemented (Sochor 2013; Berliner Energieagentur GmbH 2012b) with a total investment of 3 billion Czech crowns (ca. €120 million) and these projects saved around 800 TJ primary energy (Sochor 2013). While there remains a significant growth potential, the current level of development of the Czech ESCO market can be considered as exemplary.

The most frequent measures under EPCs target the heating systems and cooling/air conditioning. Recently complex building refurbishments, including insulation measures are also done (Berliner Energieagentur GmbH 2012b). Around 80-90% of the ESCO market is concentrated on public buildings, mainly educational and health-care facilities and municipal and regional buildings (EC JRC 2012). The residential sector is out of the scope of ESCOs, while in the industry and other private clients are rare.

Regulatory factors

While certain Czech policies are considered as drivers of the market-boom of the early 2000's (such as the Energy Management Act in 2001, state funds, etc. – see more in Marino et al. (2010)), currently the policy framework of EPC is seen as ineffective (Valentova and Szomolanyiiova 2013) and the key area for development in order to further strengthen and expand the ESCO market (EC JRC 2012).

Recent strategic documents⁴⁰ neglect EPC and energy services in general (Valentova and Szomolanyiiova 2013). Public institutions are often afraid of using EPC because of the unclear rules (e.g. about project registration, approval and accounting), and the lack of motivation/ability to deal with the complexity of ESCO projects. Furthermore, while there are public bodies that can legally participate in ESCO projects ("allowance organisations"), others, the so called "organisational units of the state" (OUS)⁴¹ are not able to apply EPC because they are legally bound not to receive or provide grants based on the Act no. 218/2000, Section 49. The only (though rather impractical) way to overcome this has been through using a special-purpose "capital investment" from the state budget. In addition the Ministry of Finance has been against ESCO solutions, considering these as secret loans (Valentova and Szomolanyiiova 2013; EC JRC 2012).

A methodology to resolve the restriction on OUS has been foreseen by the Resolution of the Government of the Czech Republic of 19 October 2011, and the draft is waiting for approval at the moment. Further improvement is expected as the result of the EED, Art. 19, which requires Member States to remove barriers these arrears are expected to change, however its transposed provisions have not been implemented yet. The above mentioned Resolution also requires the drafting of a model EPC contract and a programme for renovation of public buildings. (Valentova and Szomolanyiiova 2013)

In summary, the legal condition at the moment are not particularly supportive of the ESCO market, nevertheless they provide a suitable framework for reasonable activity.

⁴⁰ Including the Updated State Energy Policy of the Czech Republic and the Second National Energy Efficiency Action Plan (Valentova and Szomolanyiiova 2013)

⁴¹ Education or healthcare facilities are allowance organizations. These are typically owned by municipalities. On the contrary, OUS are organizations of state administration or institutions financed directly from state budget. These include ministries and other administrative bodies such as social services, police and military facilities, courts (Valentova and Szomolanyiiova 2013).

Market factors

The ESCO market is largely driven by the active promotion of the market stakeholders (ESCO companies, the facilitators and the procurement advisors). The market had been developing in terms of complexity and maturity (see e.g. the emergence of public procurement consultants, the establishment of APES).

Private sector projects are usually carried out using a combination of ESCO and state grants, and while these have significantly larger savings (up to 40-50% of baseline energy consumption), they are not fully market-based and the segment is smaller than in other Central-Eastern European countries.

Awareness and trust

The Czech Republic is amongst the most active Member States to offer wide-ranging trainings, information days, conferences and workshops to stakeholders, including potential clients and ESCOs (Berliner Energieagentur GmbH 2012b), and financial institutions (Permanent project 2012). Nevertheless further information dissemination is deemed necessary, including demonstrating the already implemented public projects, because at the moment ESCOs are seen by potential clients to offer a solution to a small niche of the energy efficiency market (EC JRC 2012; Berliner Energieagentur GmbH 2012b).

ESCOs themselves and consultants popularise energy services and search for partners. They regularly persuade new customers, assist them in project preparation and invest major human resources in repeated personal contacts (EC JRC 2012; Valentova and Szomolanyiova 2013). The Ministry of Industry and Trade and ESCO facilitators also started to participate in the promotion activities. Furthermore, the activity of consultants and advisory services helping the public sector decision makers to get engaged and conclude the public procurement processes and consequently successful ESCO contracts is considered crucial for recent development (Permanent project 2012).

A standard contract (with annexes) has been developed by APES in 2012, using funding from the Ministry of Industry and Trade (EC JRC 2012). A draft methodology for the involvement of OUS in EPC projects is also ready, but waiting for approval. The dissemination and regular update of standard documents would be necessary, too (Berliner Energieagentur GmbH 2012b).

Financing ESCO projects

The value of projects about doubled during the years 2009-2010. Preceding 2009, the average value of implemented projects was close to 50 million CZK (ca. €2 million) and afterwards it grew to over 100 million CZK (ca. €4 million) (Berliner Energieagentur GmbH 2012b; CombinES project n.d.). Today, experts estimate that projects range between €500,000 and €5 million (Valentova and Szomolanyiova 2013).

Banks are willing to invest in ESCO projects either through contracts with the client or the ESCO. Banks are familiar with the technicalities and are open for the involved risks based on the trustworthy risk management by ESCOs and their full guarantee of cost savings within the EPC contract. Therefore, ESCOs can sell the debts and future cash flow generated to banks. Another reason for such a positive attitude by banks, not broadly experienced in other countries, is the fact that most EPC contracts are in the municipal and/or recently in the regional administration, in which repayment conditions are considered safe (Permanent project 2012). Banks do not have a deep knowledge of ESCO projects and measurement and verification of savings, but employ experts to monitor projects and verify savings.

ESCO projects are regularly combined with state grants, such as operational programmes⁴² (CombinES project n.d.). This can increase the achievable savings from 20-30% to 40-50%. However there is no accepted methodology within these grants to verify savings correctly. IPMVP has been suggested as a means for more precise understanding and evaluating of upfront energy audits and later of the project implementation. (Permanent project 2012)

The Ministry of Industry and Trade included EPC support under its EFEKT programme in 2012 and 2013 (Valentova and Szomolanyiova 2013). The preparatory phase of EPC projects could be supported, therefore reducing transaction costs and increasing trust in the following investment. Having a credible and unbiased feasibility study at hand, increased the willingness to participate. Other measures (promotion, seminars, standard document preparation) were also financed by the programme (Valentova and Szomolanyiova 2013).

Barriers

While the ESCO market of the Czech Republic does not struggle with inescapable barriers in 2013, still much could be done to further strengthen the market and enable potential clients to participate. Areas in need of improvement include removal of legal barriers, improvement of monitoring systems, debt accounting and information dissemination. Above all, the strengthening of trust is needed, too, with dedicated actions and through dealing with the previously mentioned obstacles.

There are a number of legal barriers, such as the restriction on OUS to engage in ESCO projects, the complex and unclear EPC procurement rules and practices, and the lack of acknowledgement of energy services at a systematic level. .

The EUROSTAT methodology ESA 95 (European System of Integrated Economic Accounts) represents a significant problem for ESCO projects to be implemented in state-owned buildings (OUS), because it implies liability from ESCO contracts into the national debt, and therefore the Ministry of Finance does not approve such transactions (EC JRC 2012), and only special-purpose financing can overcome this problem (Valentova and Szomolanyiova 2013). The legal background needs to be changed, which has been explored by a draft methodological document (Valentova and Szomolanyiova 2013). Furthermore, split incentives are also common in some parts of the public sector.

Reinforcing the benefits and the feasibility of ESCO projects could be done through demo-projects, which would be a useful tool to systematically promote the ESCO concept in addition to the activity of the ESCOs themselves in this direction. Disseminating ESCO experiences in the private sector would be effective means to enlarge the market and tap on further ESCO potentials.

The costs and complications of monitoring, data collection and assessment is a barrier that the Czech stakeholders have been addressing in recent years, making tools and methodologies available and training experts, as well as practitioners. Contracts that involve careful monitoring have shown to attract more interest from private clients and financial institutions.

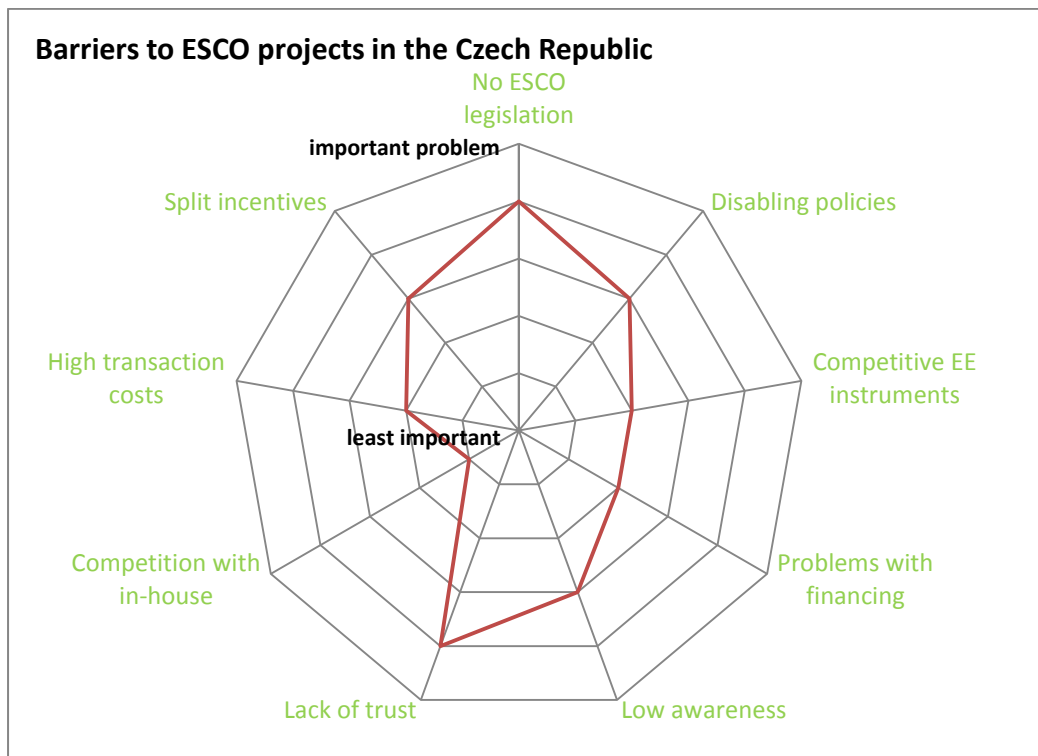
Subsidies have been available for energy efficiency improvement, and could be combined with the ESCO solution. For example in the Operational Programme Environment 2007-2013 construction measures (insulation) was supported. However, combining these with an ESCO project requires significant understanding of the technologies, project management and monitoring, while additional support is not

⁴² Operational programme Environment and Operational Programme Enterprise and Innovation

provided, thus depends on the willingness and capacity of individuals. At the same time, these combinations provide significantly larger savings and enable measures that would not be bankable on a purely market basis (Valentova and Szomolanyiiova 2013).

Finally, the lack of political instability (Valentova and Szomolanyiiova 2013) has restricted the market by making long-term agreements less secure.

In summary, the following graph illustrates the relative importance of barriers in the Czech Republic:



Conclusions and future expectations

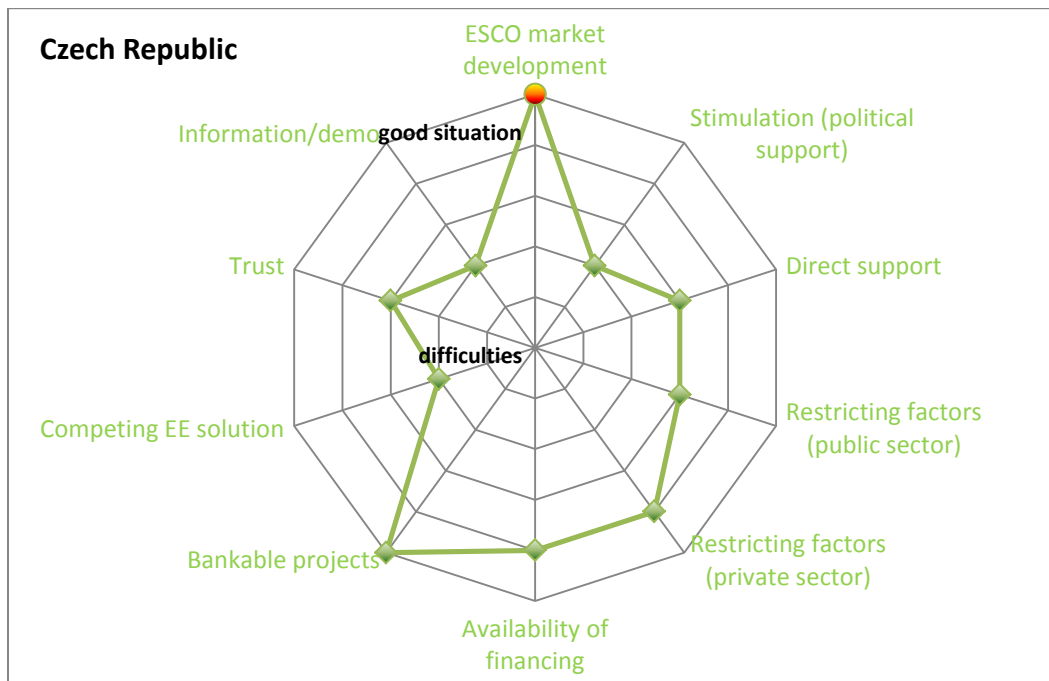
The Czech ESCO market continues to be a successful example of a very effective supply side that is willing to invest human and financial resources in promotion. A major driver is the existence and professionalism of facilitators and consultants. This is combined with a recent development of attitude by the legislators, prescribing model documents, some interest in supporting the ESCOs' own activity and making subsidies available. On the other hand, the legal conditions leave a lot of room for improvement, mainly in enabling and helping interested clients to participate (namely OUS and private clients) and improving the clarity of rules and thus increasing of confidence of the public administration to engage in ESCO projects. The private sector could mostly be helped through dedicated information dissemination.

All in all, the ESCO sector has grown to be the region's most mature and largest market and also an exemplary model at a global scale.

Key drivers

- Active promotion by ESCOs, facilitators and procurement advisors;
- Availability of EPC procurement consultants;
- Standard documents;
- Obligatory audits and other regulatory factors about 10 years ago, which still insert their effects;
- Public sector interest and continuous demand;
- Involvement of banks and in parallel possibility of combination with Structural Funds.

The following graph shows the key features of the Czech market:



The Czech Republic in a snap-shot:

Number of ESCOs	10 companies that offer EPC and 10 others that do Energy Contracting, occasionally with EPC features
ESCO market size and potential	<i>market size</i> : €10-20 million (EPC type projects, including construction and energy management costs) ca. 150-200 EPC projects have been implemented since mid-1990s <i>market potential</i> (EPC including construction and energy management costs): €100-500 million
ESCO market trend	slowly growing, with moderate market transformation and growth of complexity and institutionalization
ESCO association	Association of Energy Services Companies of the Czech Republic (APES)
Typical ESCO projects	public sector buildings (making up 80-90% of all ESCO projects) HVAC
Main type of contract	EPC with guaranteed savings

Danish ESCO market 2013

Denmark is one of the most energy efficient countries in the EU and amongst the OECD economies (Wasserman and Neme 2012). While the economy grew by 78% between 1980 and 2011, the non-transport energy demand remained unchanged with a reduction in CO₂ emissions (Wasserman and Neme 2012). Denmark is also known as an innovator regarding energy efficiency policies.

Yet, the ESCO market in Denmark was dormant until an impressive kick-start and the subsequent strong growth during the period 2007-2010 in spite of the financial crisis (Marino et al. 2010). In 2005, the ESCO activity was practically zero, while in 2007 only few (4-5) ESCOs operated in Denmark (Bertoldi, Boza-Kiss, and Rezessy 2007) increasing to 10 by 2010 (Marino et al. 2010). There has been an apparent market transformation and institutionalization trend in parallel. Until the early 2000s, projects were concentrated in the private sector (industrial sites), but public buildings have attracted more attention since 2006 with most projects being implemented in local and regional government buildings, hospitals, schools, universities and public housing (Bertoldi, Boza-Kiss, and Rezessy 2007). In recent years, the market has further expanded and moved towards the municipal products (EC JRC 2012).

Current ESCO market

As of 2013, there are about 15-20 companies that offer ESCO services in Denmark (EC JRC 2012). This is a unique 50-100% increase from 3 years ago.

About 25 projects were implemented during 2010-2013 with an average total investment of €7 million per project (ranging between €2 – 20 million). Accordingly, the size of the ESCO market is estimated to be worth €140-150 million (total investment value) (EC JRC 2012). As of 2011, 15 municipalities were already involved or had plans to start an EPC project. The number increased to 25 in 2012 and to over 30 in 2013 (representing about one-third of all municipalities) (Jensen, Nielsen, and Hansen 2013). The potential of the ESCO market is around €1-7 billion⁴³, assuming that most of the state and municipal buildings, as well as social and private housing were renovated using an ESCO and taking into account all costs within an ESCO project (EC JRC 2012).

The palette of ESCO companies is diverse. The first few projects during 2008-2010 were largely done by a few international corporations that developed experience in other Scandinavian countries (usually

Widescale ESCO project in Middelfart Triangle Region



The municipality of Middelfart has implemented energy saving measures in ca. 100 public buildings. While, the guaranteed savings were rather high (21%), actual results have showed savings up to 24 % of the total energy use. The example of Middelfart is replicated throughout Denmark.

Project timescale: 2008-2012

Investment: €6 million

Primary energy savings: 2.770 MWh

Reductions of greenhouse gas emissions: 13.430 t CO₂e/year

Source: Lorenzen (2011)

⁴³ The Danish Confederation of Industries estimated the potential at €85 million/year.

Sweden) (Jensen, Nielsen, and Hansen 2013). But in 2011 some small national companies started their march in the ESCO business, too, as due to the decline of the general construction sector and the consequent lack of orders the construction, engineering and manufacturing companies seek new business opportunities. These small, specialized companies are expected to achieve more dominance in the market (EC JRC 2012).

Utility companies were not active in the market until recently, but are also setting foot in this area with their first project in 2012, partially because they are looking for opportunities to diversify their offers, secure their market position and market shares, and because of the energy efficiency obligations scheme (see below) (EC JRC 2012). These energy providers and grid companies (the obligated parties) are obliged to employ a third party for their energy efficiency services offers, which benefits existing ESCOs and induces the establishment of separate shareholder companies that regularly collaborate with ESCOs⁴⁴ (EC JRC 2012; Boonekamp and Vethman 2010). All of the currently active ESCOs carry out ESCO projects as supplementary to their core businesses, but it is expected that in the future energy services will be a core business in the case of the majority of the stakeholders (EC JRC 2012).

Although there is an interest to establish one, at the moment there is no pure ESCO association in Denmark. The Danish Confederation of Industries manages an ESCO network and has the potential to act as a representative body for its 40 members (not all of them are active as ESCOs). There are similar initiatives, such as the Danish Energy Solutions network.

Types of projects

Before 2008, when one of the first municipal ESCO projects (see box) was implemented⁴⁵, ESCO type projects were known almost exclusively in the industrial sector. These were only a few projects. Since the success of Middelfart and other parallel projects, the public sector has merged deeply in EPC (EC JRC 2012).

As of 2013, municipalities seem to be divided on what the best solution could be for them. There are still many municipalities who insist on carrying out energy renovation with in-house resources, because they believe they can achieve energy savings at a lower cost and with better success without external intervention (an approach common before). On the other hand, by now there are many municipalities who favour ESCOs in order to accelerate project implementation⁴⁶ and to reach higher energy savings⁴⁷ (Leonhart 2012a; Udbudsradet 2012). For several municipalities (mainly smaller ones), the access to financing through ESCOs is the only solution, as the investment would require a larger capital basis than accessible for them due to their size (EC JRC 2012; Udbudsradet 2012). After a comparison of the two solutions by an expert group, it is clear that there is no universal solution (EC Network 2012). Many municipalities actually combine and/or switch renovation models (EC JRC 2012). As of 2013, few

⁴⁴ The obligated parties may either provide direct subsidies to any energy end-user (consumer/business/public), or offer energy services to their own energy customers and related to the energy type they supply (EC JRC 2012).

⁴⁵ Indeed, another municipality, Kalundborg was the first to sign an ESCO contract in 2006. However, due to the municipal structure reform in 2007, the collaboration was delayed and restarted only in 2009. By this time, 2 other municipalities, Gribskov and Middelfart had their projects started. These three municipalities established an “ESCO network” (Jensen, Nielsen, and Hansen 2013).

⁴⁶ Based on a survey by the Danish Competition And Consumer Authority, project implementation can be three times quicker in an ESCO project than in an internally managed project of the same kind (Udbudsradet 2012).

⁴⁷ Twice as much energy savings in average, based on a survey by the Danish Competition And Consumer Authority (Udbudsradet 2012).

hundred buildings have undergone an ESCO intervention in about 30 municipalities, in addition to some hospitals and buildings of the central authority (EC JRC 2012).

The experiences and practices of the municipal ESCO model has been occasionally used for private households since 2011. The framework and concept has been adapted to private dwellings by combining it with the “ESCO-light” initiative within the working group established by the Minister of Climate and Energy in February 2010. However, success is limited for a number of reasons. The owners of private dwellings are often uneasy about complicated refurbishment work and are doubtful about the extent of the potential for savings. In order to overcome these barriers, it has been proposed that policy mechanisms be prepared to support holistic energy saving solutions and thus achieve higher and more credible results (Danish Energy Agency 2011). A pilot project was carried out, where more than 160 homes were involved. Energy saving achievements were around 638,000kWh per year. Individual home renovations are usually self-funded however home owners receive a grant incentive of €3.2 per kWh saved energy⁴⁸.

There are efforts to disseminate experiences from municipalities to the private tertiary sector, too, but no projects have taken place so far (EC JRC 2012).

Projects usually involve a bundle of many buildings (an average of 60 buildings per project was common in 2011 (Jensen, Hansen, and Nielsen 2011)) or measures, where those with a shorter payback time compensate for the parts with longer payback (Leonhart 2012b). As a result, ESCO projects generally have a timeframe longer than 10 years. Based on the already implemented municipal ESCO projects, a minimum of 50,000 m² is needed to reach profitability with a uniform building stock (Leonhart 2012b). The energy savings guaranteed under a project range between 16-17% to 30-31% reduction of the energy budget, with an average of 21% (Jensen, Nielsen, and Hansen 2013).

ESCO projects differ in the share of responsibility between the client and the ESCO (Leonhart 2012b):

- In contract type 1, ESCO acts as an adviser and is remunerated based on the savings target achieved (incentive-based advice);
- In contract type 2, the ESCO takes over the operation of the system besides guaranteeing the savings based on the measures suggested by them;
- In contract type 3, the ESCO will be responsible for the implementation phase in addition to the parts (advice and operation) included in type 2;
- In contract type 4, the ESCO provides full service, and owns, finances, implements energy efficiency improvements and operates the system afterwards.

Furthermore, most projects include energy labeling of the building(s) and training of the staff (Jensen, Nielsen, and Hansen 2013). Many of the potential buildings have already undergone energy certification are required by the regulation (EC JRC 2012), which can reduce transaction costs of projects.

EPC with guaranteed savings is the most common contract type (EC JRC 2012). While ESCOs usually could offer the financing of a project, it is more economical if the municipality pays from its own budget or takes a preferential bank loan. Industrial clients prefer to finance the projects themselves (see more under “Financing”). Interestingly, the contracts signed by ESCOs and municipalities in Denmark, give the option for the municipality to quit at certain stages. This provision has been able to give the municipal

⁴⁸ <http://www.managenergy.net/resources/1449>

decision-makers more confidence, especially when municipalities rarely know the ESCO supplier beforehand (Jensen, Hansen, and Nielsen 2011).

Regulatory factors

The general energy efficiency framework is particularly strong in Denmark, combined with political commitment not only at local (municipal) level, but at national and micro level, too (companies, public). The legal environment does not particularly hinder, nor drive the ESCO business (EC JRC 2012). Denmark has not developed a specific regulatory framework for the ESCO market, but these market based mechanisms rather thriving on the general supportive environment and sporadic initiatives. It may be concluded that a coordinated effort has not been taken in this respect.

The public image and political commitment is considered as crucial, and environmentalism is a key driver of energy performance improvement, which provides a good ground for market based investments, too. Municipalities that participate in climate or environmental initiatives (for example in the Covenant of Mayors, in Climate Municipality⁴⁹, or in the Curb-cutting agreement⁵⁰), especially when it entails mandatory targets, are more likely to engage in an ESCO contract (Jensen, Nielsen, and Hansen 2013; EC JRC 2012).

Nevertheless, there are a number of regulatory measures that have contributed significantly to the success of the ESCO market. First of all, the transposition of the recast EPBD (2010/31/EU) has been one of the most important cornerstones. Energy labeling of buildings was first used as the basis to oblige municipalities to carry out most evident investments under an agreement between the government and the association “Local Government Denmark”. The agreement provided for the implementation of all measures identified within the energy certificate with a payback time under 5 years (Jensen, Nielsen, and Hansen 2013). Later, municipalities were allowed to take large loans already at the start of renovation works, of the projects that incorporated the completion of measures that were identified within the energy certificate. Normally, loan-financing renovations would not be allowed (Jensen, Nielsen, and Hansen 2013).

The requirements to produce national energy strategies and plans (such as NEEAPs and NREAPs), as obliged by European Directives, have also encouraged the government to consider ESCOs as providers of larger energy savings and understand their role in holistic projects, e.g. through the inclusion of RES within the projects (EC JRC 2012).

The other core legislative driver is the operation of the energy efficiency obligation scheme (Boonekamp and Vethman 2010). The current Danish scheme is a follow-up of a demand side management initiative introduced in 1995, and changed into the current system in 2006, which now consists of an annual binding target for all energy distribution companies, i.e. electricity, district heating, natural gas and oil for heating regardless of their size. Earlier the initiative was an information/advice/audit scheme. Today, obligated parties are responsible to ensure the realization of energy efficiency services inside or outside

⁴⁹ A voluntary agreement between the municipality and the Danish Nature Saving Trust, which obliges the municipality to reduce energy consumption by 2% per year in the municipality’s territory, including private buildings. The agreement covers all kinds of energy, including supply, transport, electricity, etc. in 2011, about 2/3 of all Danish municipalities had signed such an agreement (Jensen, Hansen, and Nielsen 2011).

⁵⁰ Another voluntary agreement with the Centre for Energy Savings, in which the municipality commits to reduce electricity consumption in public buildings by 2% per year (Jensen, Hansen, and Nielsen 2011)

the DSO controlled supply area and within all types of energy carriers⁵¹. Furthermore, small scale household wind turbines⁵² count as savings as long as the plants stand on their own property (Danish Energy Association 2012). Given that the obligated parties have to employ a third-party to carry out the energy savings, the system encourages the collaboration with ESCOs (EC JRC 2012).

Market factors

The Danish ESCO market is mainly demand-driven, but at the same time the persistent marketing activity of ESCOs has been crucial, too. The role of regulation is limited and the ESCO solution has been taken up because it offers advantages over in-house solutions or other alternatives. The decline in the construction business directs inactive companies to search for alternative business opportunities, which may be the ESCO sector. Some utilities (in fact, via their separate shareholder companies) started to offer energy saving projects for their clients in order to expand or keep their markets.

Interestingly, Denmark has a unique set of strong national targets within the Energy Agreement of March 2012. Yet the policy does not set mandatory requirements for municipalities in this respect, on the other hand, municipalities take up the lead and are active in energy rationalisation and energy planning (Leonhart 2012a). While budgetary savings represent an overall economic drive, political commitment is probably more important in the success of the ESCO project uptake.

Awareness and trust

Environmental and climate awareness is very high amongst the general public as well as at a political and decision-making level. Large budgets have been available for information dissemination and motivation (Klima OG Energiministeriet 2011), for example DKK 5-10 million per year has been spent on campaigns between 2008-2012.

Numerous agreements exist between the state and municipalities to use the Energy Labelling System of buildings and to ensure the implementation of the recommended energy efficiency measures. Voluntary agreements on climate goals (including the Covenant of Mayors) have also had a large influence on the establishment of municipal initiatives (EC JRC 2012).

Municipalities manifest a clear interest in energy rationalization via ESCO projects. They have the opportunity to learn from a large number of successful examples, which are widely disseminated and municipalities are able to attract colleagues through experience sharing. Furthermore, personnel from local governments are encouraged to take part in local, national and European-wide trainings to develop their understanding of the concept and ability to manage the projects (Berliner Energieagentur GmbH 2012a).

Financing ESCO projects

The general fiscal system of Denmark provides a supportive basis for the financing of energy efficiency. Tax on energy consumption and pollution has been a significant contribution for the reduction of labour tax after the 2009 green tax reform. Energy and CO₂ taxes are amongst the central drivers of the

⁵¹ see also footnote 44

⁵² earlier photovoltaics, too

increased profitability of ESCO projects. There are other earmarked fiscal income types, such as the “energy savings charge”⁵³ or the “Renewal Fund”.

All in all, financing ESCO investments is not difficult. Projects are almost exclusively financed by the client. Third party financing is not applied for ESCO projects in Denmark (similar to other Scandinavian countries). Municipalities are in a significantly better situation than in most of the other EU countries because – to start with – they are generally not indebted and do not experience liquidity problems, thus are able to engage in long term contracts, even if these involve taking loans. Furthermore, when the municipal building operator receives the budget to pay for the renovation expenditures, the municipality depreciates the future annual electricity, water and heating budget of the institution with the value of the calculated financial saving. In that way, the institution is not disadvantaged compared to its situation before. If the institution is able to cut down more on the consumption – e.g. by behavioural changes – the institution can have the extra saving at its disposal. (Lorenzen 2011). Other financing models are also possible and are usually developed according to the needs of the specific projects (EC JRC 2012).

The budgetary limitation – common in other EU countries – is always a significant limitation on the size and amount of renovation project that a municipality can do. In Denmark, however this limitation was removed between 2009 and 2012 in case the measures were carried out in the scope of an ESCO project. The aim of this regulatory relief was to stimulate the economy (EC JRC 2012). Consequently, a major reason to enter into an ESCO project was the accessibility to a much larger budget (Jensen, Hansen, and Nielsen 2011). With the limitation being put back, it is seen as a possible draw-back for ESCO projects and larger energy-renovation projects in general (EC JRC 2012)

Municipalities that aim at staying out of the ESCO business claim to do so because of the better economy they can achieve alone. In particular, large municipalities that have the budget and that have human resources seem to be better off doing a renovation on their own. However others, especially those that would need to train or hire the technicians end up paying less for a project if done with the help of an ESCO (Jensen, Hansen, and Nielsen 2011)

Further ESCO drivers include the state guarantee behind municipal loans (EC JRC 2012), and the Kommune Kredit, a public bank⁵⁴ that can lend to municipalities at a very low rate (EC JRC 2012).

Barriers

The key barrier of the Danish ESCO market 3 years ago was the lack of trust in the concept and the widespread availability of alternative means to achieve energy efficiency improvements. Today skepticism is still widespread, and 60% of the municipalities have chosen to carry out renovations with in-house expertise (Udbudsradet 2012), which they evaluated to be more economical (Jensen, Nielsen, and Hansen 2013). Municipalities that consider entering an ESCO contract, but have not done so, often perceive risks as too high, often based on the fact that many ESCO suppliers are unknown companies. This problem is overcome with a larger flexibility in the contracts. Entering an ESCO project may depend

⁵³ used for the funding of the Energy Saving Trust (Klima OG Energiministeriet 2011)

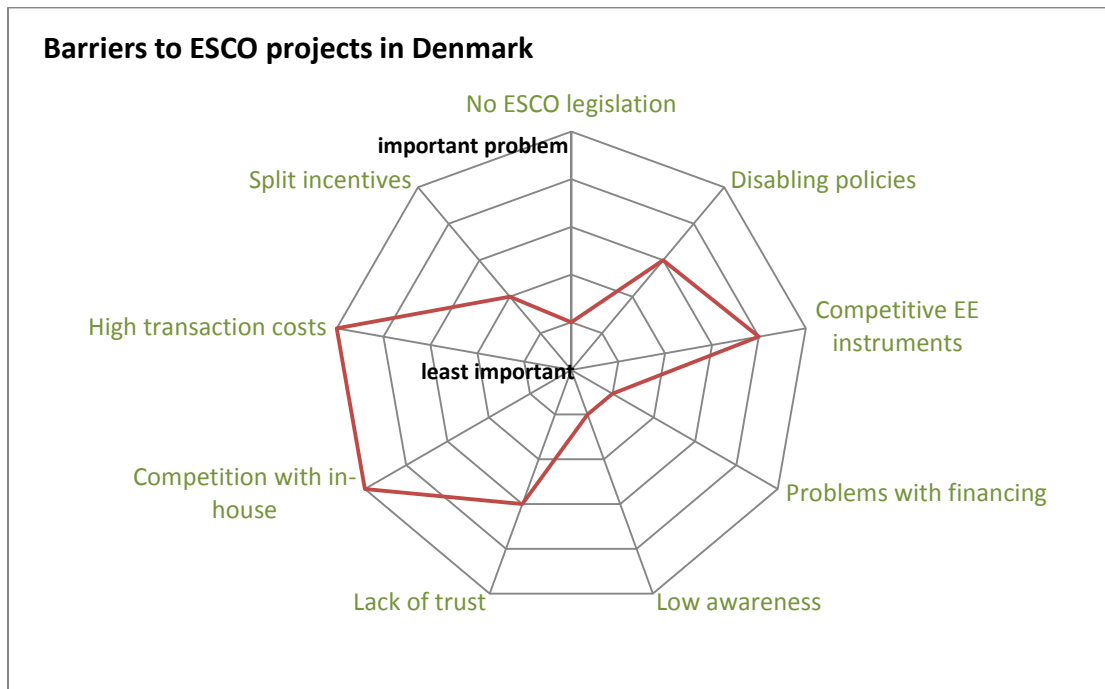
⁵⁴ legally an association (a membership organisation), established by a special Act in 1899, and supervised by the Ministry for Economic Affairs and the Interior. See more at: http://kommunekredit.com/Admin/Public/DWSDownload.aspx?File=%2fFiles%2fFiler%2fKK_uk%2fpdf%2fKK_OnePager_UK_03-2013.pdf

on the personal resistance by in-house building operation personnel, who may be afraid of outsourcing (EC JRC 2012)

Transaction costs represent the central problem for ESCO projects today (and to energy efficiency renovation in general, although it is less highlighted in case of the internally handled projects). Even if everything is handled by the ESCO, internal staff must be trained and prepared for the project. Transaction costs are raised by the need for data collection and the lack of previously done benchmarking and documentation of earlier interventions (EC JRC 2012). Bundling has been applied as an effective way to counteract transaction costs. There might be problem with the lack of data. A group of municipalities have calculated that ESCO is a costly solution (Jensen, Nielsen, and Hansen 2013). They also argue that when projects are carried out by in-house competences, the knowledge remains internal and can be profited by future projects (Jensen, Nielsen, and Hansen 2013). On the other hand, the municipalities that are engaged in ESCO projects, experience that the same measures result in larger total savings and quicker realization, therefore higher profitability (EC JRC 2012; Leonhart 2012b).

Finally, public procurement of EPC is considered as complicated by some stakeholders, and may increase costs or delay the projects, but others have been successful in dealing with it. The lack of a targeted regulation has been noted by most of the respondents of the JRC survey, others believe that it is not necessary for the market (EC JRC 2012). On one hand there are certain obstacles, such as complex procurement, which could be dealt with dedicated ESCO regulations, but on the other hand the existing legislative framework is already favourable of general energy efficiency, and ESCOs have proven to be able to find their way through, and serve as one of the many alternatives, while it is not forced on energy users that feel uncomfortable or who prefer other appropriate methods.

In summary, the following graph illustrates the relative importance of barriers in Denmark:



Conclusions and future expectations

There is a disagreement amongst local experts and players whether the growth seen in the ESCO market can be considered as a success or it falls behind expectations. Based on the survey respondents' opinion (EC JRC 2012) and when compared to other countries, the developments seen in Denmark by 2013, are clearly unique and exemplary. The strong growth and orientation of the ESCO market reflects that the ESCO-concept fits well with a number of problems that municipalities experience. The flexibility in the energy renovation approach, whereas municipalities are able to select the ESCO solution as one of several others is definitely an advantage in Denmark. In addition, the flexibility of the ESCO contracts and the possibility to opt out at certain stages has been a unique procedural driver, increasing trust which has been the major barrier in the context of public sector projects.

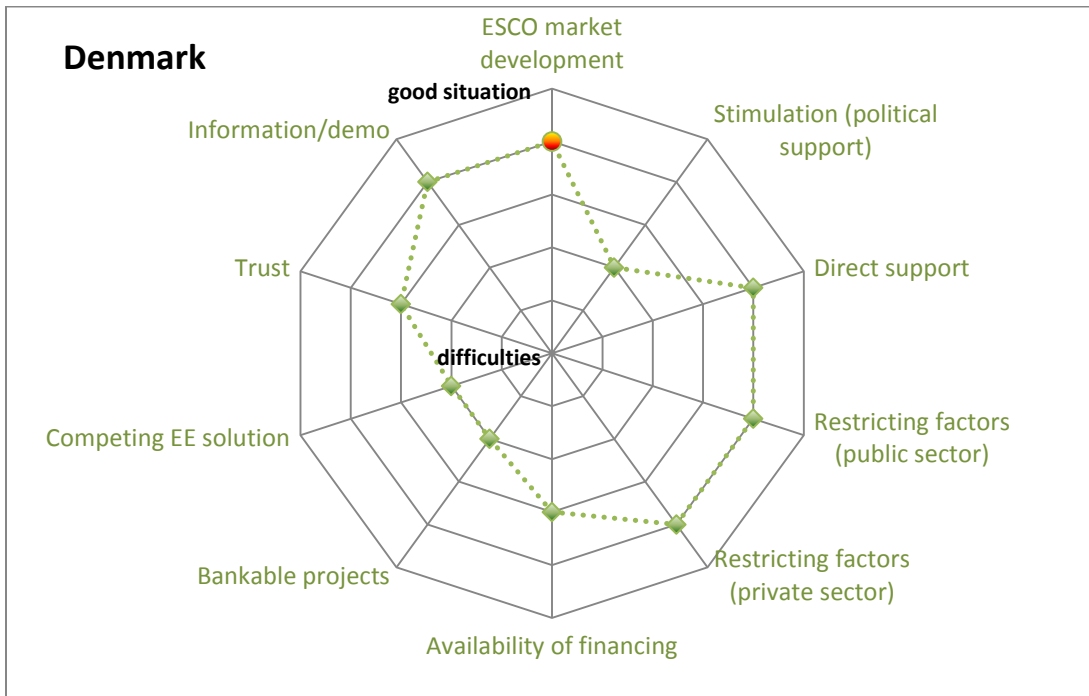
The regulatory drivers have had a limited role, which indicates a natural development of the sector and can be considered as one of the healthiest ESCO markets in Europe. The kick-start (the example of Middelfart) needed targeted and direct support, as well as the conscious dissemination of this pilot experience, but afterwards and since then the market could move ahead on its own. The benefit that ESCO projects have enjoyed lies with the preferential loan (that is however available for non-ESCO municipal projects, too), and the removal of budgetary limitations. Municipalities that have not engaged in ESCO projects usually have other, and from their point of view, better options for energy renovation.

It is to be seen, whether the market will be able to continue its stride with the budgetary limitation back in place, however with the ever more stringent energy efficiency targets and the energy efficiency obligation scheme.

Key drivers

- High climate and environmental awareness;
- Political commitment, pronounced climate targets;
- Successful examples and successful dissemination;
- Lack of liquidity problems of municipalities (capable of taking loans);
- Relief of budgetary limitation for ESCO projects between 2009-2012;
- Particularly flexibility of the ESCO contracts;
- EU legislation, namely recast EPBD (2010/31/EU), EED (2012/27/EU), NEEAPs, NREAPs;
- Energy efficiency obligation system.

The following graph shows the key features of the Danish market:



Denmark in a snap-shot:

Number of ESCOs	15-20
ESCO market size and potential	market size: €140-150 million market potential is estimated to be €1-7 billion (investments, considering all costs within an ESCO project, and taking into account public buildings and social and private residential buildings)
ESCO market trend	strong growth
ESCO association	none
Typical ESCO projects	main target sector is the municipal real estate, and focus on street lighting is increasing Industry and residential housing projects exist, but less significant
Main type of contract	EPC with guaranteed savings

Estonian ESCO market 2013

The Estonian energy services market has not yet been able to take off primarily as a consequence of state grants and low interest rate loans available for energy efficiency in the public and residential sectors that compete with market-based offers (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). The industrial sector has its internal technical and financial capacity to implement EE projects and therefore the interest in the ESCO concept is very low. According to the first NEEAP of Estonia, the government had plans to upscale the ESCO market through measures such as the “development of the

provision of energy services and the training of specialists” (Ministry of Economic Affairs and Communications of Estonia 2011), however these activities were not (yet) realised.

Current ESCO market

There are 3 small local companies in Estonia that deal with ESCO services as a supplementary business (EC JRC 2012). The market is practically unchanged for more than a decade with very few ESCO projects carried out. The current size of the market and its potential are unknown, though the market potential of all building renovation is estimated at €100 million (EC JRC 2012). In 2013 the Estonian government conducted a market research on ESCO opportunities with the help of the Environmental Investment Centre and the agency is seeking ways to secure resources from the next EU budgetary period for diminishing the harmful impact of accumulated discounting of the external financing of ESCO projects. Possible bridge financing for ESCOs is also analyzed. Several ESCO seminars have been conducted, but as the market lacks the proper ESCO financing instrument, local ESCOs cannot convince potential clients into entering EPC negotiations.

There is no ESCO association in Estonia.

Types of projects

The few engineering ESCO projects that are done, are directed at HVAC refurbishment, automation, lighting in private tertiary buildings, such as hotels, offices, retail, and sometimes in industrial buildings (EC JRC 2012). Mostly third part financing has been used and due to lack of proper ESCO financial instruments only engineering and project management is offered.

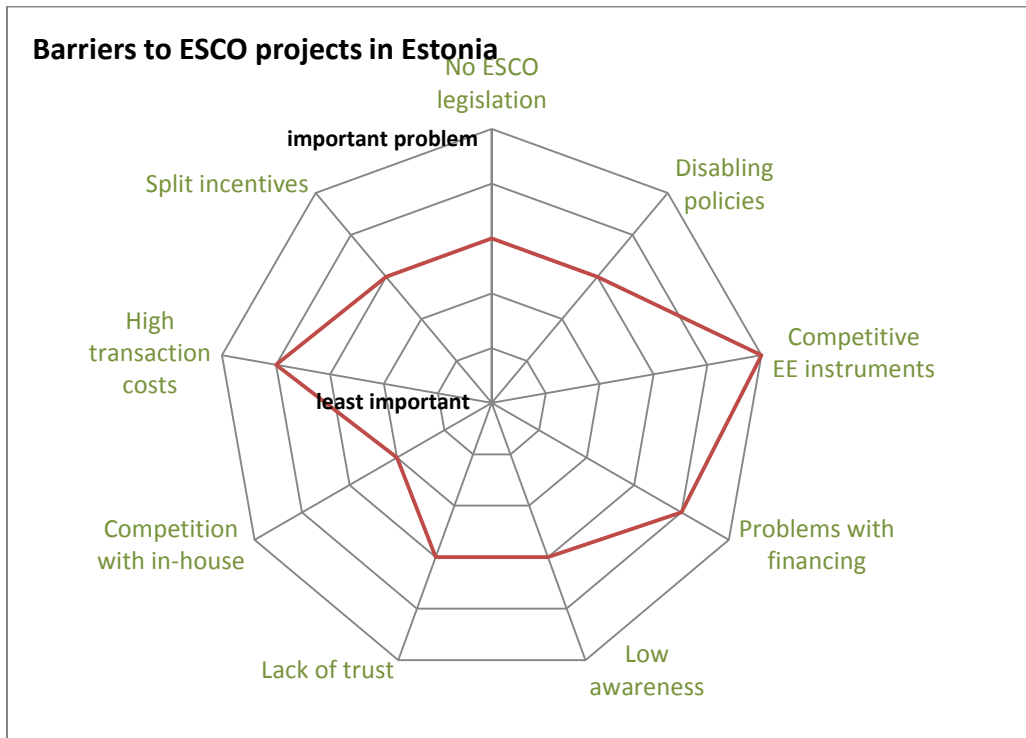
Barriers

Competing energy efficiency solutions in the building sector are of outmost importance. State grants⁵⁵ and low cost loans for the housing sector practically impede efficiency offers based on profitability as high expectations for continuation of the grants makes competitive offers difficult. Based on the second NEEAP, these are planned to be continued (Ministry of Economic Affairs and Communications of Estonia 2011), even though source of the financing is still unclear (EC JRC 2012).

Besides, ESCO relevant regulation is missing in Estonia, as well as awareness of and available information about energy services. Furthermore, energy efficiency, including ESCO projects are small and thus transaction costs are high.

⁵⁵ <http://www.kredex.ee/korteriuhistu/korteriuhistu-toetused/rekonstrueerimise-toetus/rekonstrueerimise-toetuse-otsuse-saanud-korterelamud/> <http://www.kredex.ee/apartment-association/toetused/rekonstrueerimise-toetus/>

In summary, the following graph illustrates the relative importance of barriers in Estonia:



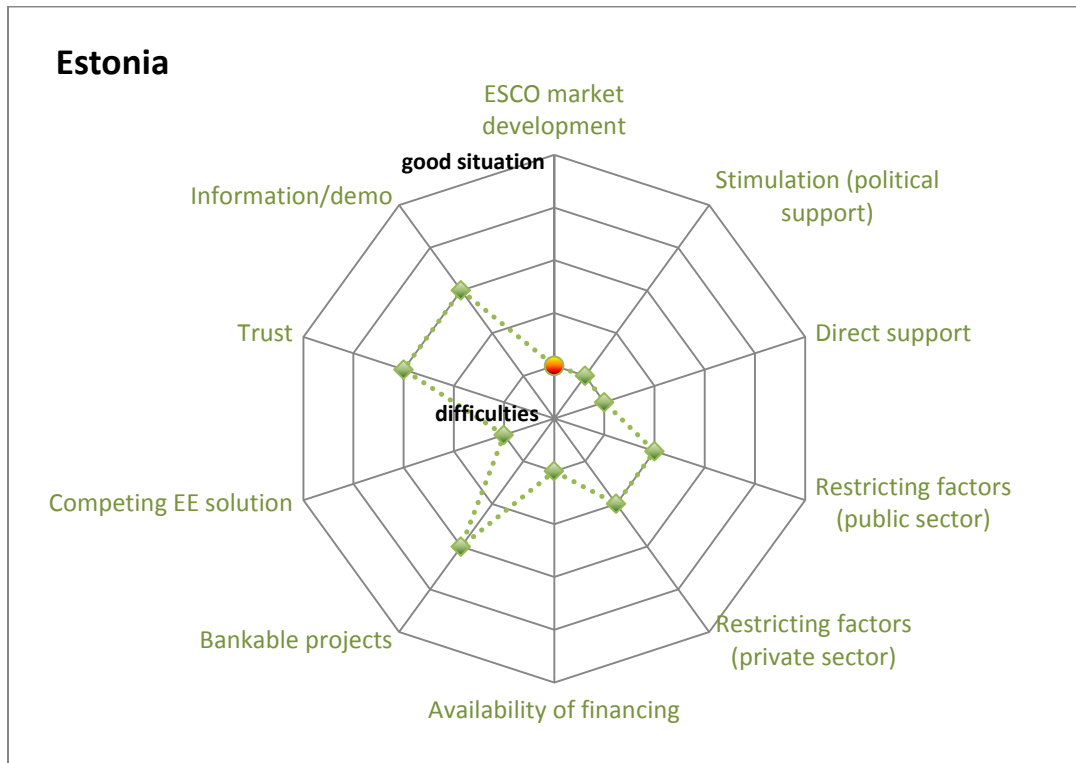
Conclusions and future expectations

Given that residential buildings are renovated in Estonia using state grants and low-interest rate loans, and therefore there is a continuous improvement of building energy performance, there is little room for market-based solutions. According to the current plans of the government these financial solutions will continue to be available (Ministry of Economic Affairs and Communications of Estonia 2011), thus change on the ESCO market is not expected. Therefore concentration on industrial, tertiary and service sector is expected.

Necessary changes to start-up the market

- Working out complementary financial instrument for state grants and cheap loans;
- Governmental support in the form of proper supporting legislation;
- Concentration on industrial, tertiary and service sector.

The following graph shows the key features of the Estonian market:



Estonia in a snap-shot:

Number of ESCOs	2-3
ESCO market size and potential	market potential unknown (potential of total building renovation: €100 million)
ESCO market trend	stagnation
ESCO association	none
Typical ESCO projects	private tertiary and industrial buildings, HVAC, automation, lighting
Main type of contract	N/A

Finnish ESCO market 2013

The Finnish ESCO market started up about 15 years ago, with only one service provider at that time (Marino et al. 2010). After a gradual progress between 2000 and 2010 a relatively stable, though small market established (Marino et al. 2010; Siltainsuu 2012). In the future further growth and/or transformation are foreseen due to a number of supportive actions and circumstances.

Current ESCO market

The exact number of companies that include ESCO services on their portfolio is unknown, but it has been revolving around 5-8 during the last years, based on the ESCO project list of Motiva⁵⁶ and the JRC survey (2012). Experts estimate that there are 5-6 ESCOs that are actually active companies. The government understands ESCOs as companies that finance projects from the value of the savings and provide monitoring and verification services (Koski 2011). There are ESCOs which belong to large international firms and deal with ESCO projects as part of their various services (EC JRC 2012). These companies are building and control manufacturers, and consultants. About the same number of ESCOs are small domestic companies (Siltainsuu 2012).

No ESCO association is known to the authors of this report as of 2013, nevertheless Motiva, a government agency plays a crucial role in the facilitation of the ESCO market and EPC usage. Motiva has created standard tendering and contract documents for ESCO projects, and prepared a guidebook to support ESCO project development. Motiva has a program where they agree on targets and substantiating plans with municipalities to achieve certain amount of energy savings (Siltainsuu 2012). These pledges can lead to the application of the ESCO concept.

The market size was estimated to be around €4 million in 2009 (Marino et al. 2010), and about €10 million annual turnover in 2011 (Siltainsuu 2012), however an official estimate is not available because the ESCO project registry maintained by Motiva is based on self-reporting, and ESCOs have been reluctant to provide information lately (EC JRC 2012). The market potential is estimated at a maximum of annual €200 million maintenance cost reduction (EC JRC 2012) including €100 million per year in public buildings⁵⁷.

Municipal projects become more popular than industrial ones in Finland.

In the last few years, one of the active ESCOs has implemented projects in Turku, Kuopio, Jyväskylä and Akaa. The 10-year ESCO project involving the bundling of 9 buildings in the municipality of Siilinjärvi will result in electricity and heat consumption reductions, producing a reduction of carbon dioxide emissions by as much as 450 tons annually. The project will involve the modernisation of automation, changes in heating methods, changes in ventilation machines, with a total value of investment of €1.1 million.

Source: Invest in Finland (2013)

Types of projects

Industry has been the traditional target sector of ESCOs, however in the last years more ESCO projects were done with municipalities. It is common to bundle smaller investments. While this sector offers a large saving potential, and the experiences from earlier projects successfully develop the market, a few projects have also faced important problems and affected the whole sector, when public procurement rules were not always followed properly, and the projects had to be stopped for investigation or be cancelled (EC JRC 2012). As a response, a guidebook for public ESCO procurement was prepared by Motiva, which may help to overcome this crisis (EC JRC 2012; Koski 2011). Furthermore, municipalities have the benefit of being trustful clients that can engage in long-term contracts and they have a steady and predictable energy consumption.

⁵⁶ <http://www.motiva.fi/toimialueet/energiakatselmustoiminta/esco-palvelu>

⁵⁷ based on a report by the ESCO YIT. See more at: <http://www.investinfinland.fi/articles/news/cleantech/green-building/finlands-public-buildings-could-save-eur-100-million/100-900>

In the private real estate the ESCO solution has not gained popularity mainly because of the mismatch between the long-term features of an ESCO project and the volatile nature of companies that own offices and retail buildings (Siltainsuu 2012).

During the times of industrial projects, ESCOs focused mainly on single technologies, e.g. heat recovery. However, with the changing focus towards buildings and municipal projects, ESCO services are becoming more complex and more adapted to the complex needs of the client. It is mainly the HVAC systems, pumps, automation, lighting that are improved. While in the case of industrial clients ESCOs were competing with in-house expertise, municipalities are more in need and therefore more open for an outside expert or outsourcing. (Koski 2011; EC JRC 2012)

It is interesting that Finnish ESCO projects often involve behavioural elements, and the building/site users are also involved in the energy savings (EC JRC 2012). Some projects even prescribe that energy efficient behaviour should be part of the job description of employees (Motiva Oy 2013).

ESCO contracts are typically formulated as classic EPCs, and the clients are aware of the concept and its tricks and benefits as a result of a strong governmental promotion and clarity at higher levels. Variations of the guaranteed savings model of EPC are most popular, whereas the contractor pays the difference between the guaranteed and achieved savings if the final results fall short of the agreed level of savings. Projects are usually turnkey services where financing, monitoring and verification are almost always part of the contract (EC JRC 2012), and they usually involve elements of regular renovation besides energy improvements. The typical size of a project ranges between €0.5 million and 3 million (Siltainsuu 2012).

Regulatory factors

There are a number of supportive legislative elements and measures in Finland. The most important element is the voluntary agreements, whereas partners that join commit themselves to performing an audit and implementing energy efficiency actions. Further government support includes subsidies available for ESCO projects, information dissemination, guidebooks and matchmaking support between clients and contractors.

The government actively supports ESCOs, mainly through commissioning Motiva to disseminate information about ESCO services, connecting ESCOs and potential clients, maintaining a project registry, producing ESCO-related guides, and developing contracting models. From 2011, after a few unsuccessful ESCO procurement projects, an ESCO procurement guide for the public sector was developed in 2012 (Koski 2011). The government has also created an ESCO definition (see above), which is used in relation to regulation and financing (Koski 2011). General terms of consultancy contract (KSE 95) are applied for auditing and design, while general terms of building contract (YSE 98) are the basis for installation and execution contracts (Siltainsuu 2012). Nevertheless guarantees and performance agreements are agreed on a case-by-case basis. Public procurement practices favour EPC because several criteria are taken into account. However, this approach also has its dangers, because some bidders have gone to court claiming that there are too many criteria and many of them are not objective (Siltainsuu 2012). For the moment, no appropriate solution has been found to overcome this, although a guidebook has been produced to help the participants.

The second National Energy Efficiency Action Plan confirmed the importance and success of the sectoral Energy Efficiency Agreements (earlier Energy Conservation Agreements). Agreements are available in all sectors, including industry, services, municipalities, transport, and agriculture (Motiva Oy 2013). Companies that accede these agreements must implement and monitor energy efficiency measures.

Carrying out these measures with the help of an ESCO is an option under the agreements, which may boost the volume of ESCO services.

Market factors

While the ESCO market seems to be largely driven by governmental support, Boonekamp and Vethman (2010) believe that a market driven energy efficiency investment segment is also significant.

Awareness and trust

Finland has been exemplary in active information dissemination, providing demonstration projects, and supporting ESCO project development, and continues these activities. The main actor in this activity is the government agency, Motiva, however ESCO companies also take active part in promotion.

In the beginning, when the ESCO concept was unknown, the sales process was largely human-resources intensive due to the time and devotion needed for the explanation and introduction of the model to the potential clients (energy-intensive industry at the time). Afterwards, as ESCOs were gaining popularity, potential clients could prepare a project (e.g. through carrying out audits) themselves. Accordingly, projects have become much shorter, easier to start and result in payback times of only 3-5 years (Siltainsuu 2012).

Financing ESCO projects

EPC projects that are implemented according the official definition may be eligible for a financial grant of up to 20-25%⁵⁸ of investment costs related to energy efficiency improvement in 2013, provided by the Ministry of Employment and the Economy (Koski 2011; Boonekamp and Vethman 2010). Furthermore, energy audits that follow the guidelines and rules of Motiva and the Ministry of Employment and the Economy are subsidized in all major sectors, making ESCO projects quicker and cheaper.

Barriers

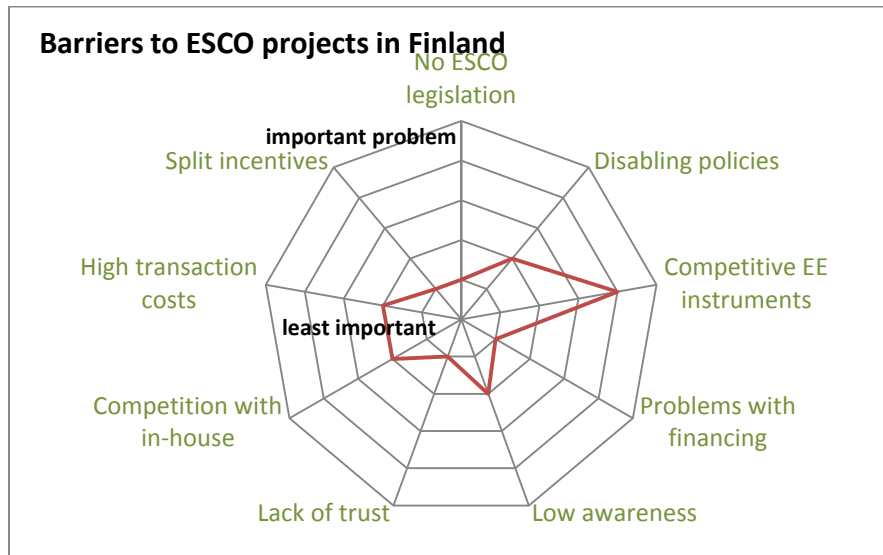
The main barrier for further ESCO development is the existence of competing alternative solutions. There is no information which of the energy efficiency improvement means would be less costly for the society or provide a larger or easier energy saving result. Municipal buildings are typically in the hands of one central organization in bigger towns and cities, which is skilled enough and has the financial means to carry out energy efficiency investments on their own. In addition, they can borrow money below the ESCO financial rates, if necessary (EC JRC 2012).

Furthermore, public procurement rules are considered as a major problem for ESCOs. The bidding process is complex and difficult. One expert suggested that EPC projects should not go through a procurement process because after all the client will be the owner of the savings following the ESCO investment.

Besides these, experts, do not see major barriers to ESCOs in Finland, but refer to concerns about small project size and perceived business and technical risks. At the same time, there are solutions available for these obstacles.

⁵⁸ The level of the subsidy is re-evaluated by the Ministry every year.

In summary, the following graph illustrates the relative importance of barriers in Finland:



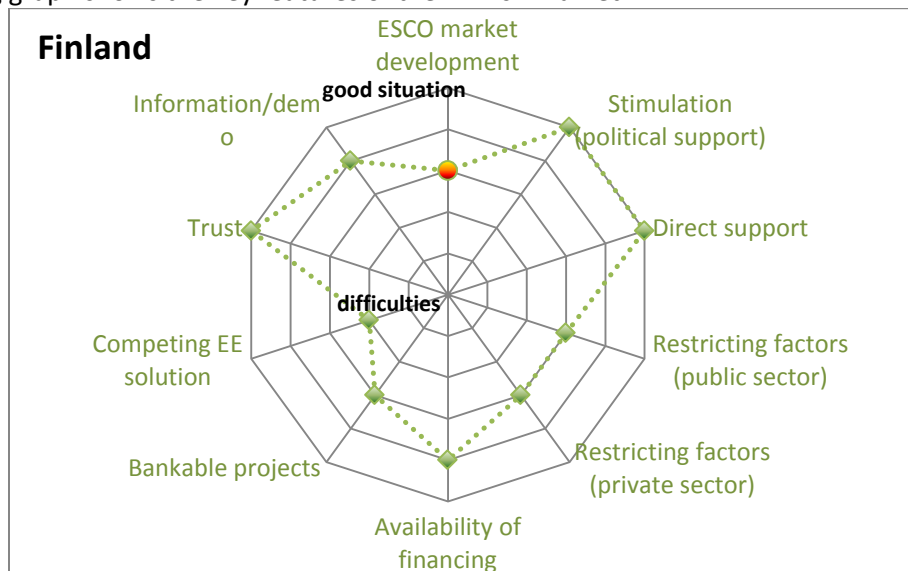
Conclusions and future expectations

The significant and varied support from the authorities has resulted in a stable though quite small ESCO market. It is clear that ESCO services are treated in Finland as an energy efficiency solution, but not as the only one, i.e. not as a “silver bullet”. Nevertheless, development has been recorded in the last few years, and opportunities to combine various energy efficiency tools, e.g. voluntary agreements, ESCOs and information can serve as an example for other markets (EC JRC 2012).

Key drivers

- Governmental support in the form of obligations, subsidies, information dissemination, etc.;
- Clear ESCO definition;
- ESCO services treated as one of many alternative energy efficiency solutions.

The following graph shows the key features of the Finnish market:



Finland in a snap-shot:

Number of ESCOs	5-8
ESCO market size and potential	<i>market size: unknown market potential: €100-200 million</i>
ESCO market trend	<i>slowly growing in volume focus changed from industry to public sector</i>
ESCO association	none
Typical ESCO projects	<i>public sector buildings: HVAC, pumps, lighting, automation projects in all main sectors due to varied voluntary agreements</i>
Main type of contract	EPC

French ESCO market 2013

The French ESCO market is amongst the frontrunners in Europe. It is a particular market, very much unlike others in Europe, with numerous special features, even with its own terminology.

France is known as the cradle of energy service contracting in Europe that started with the provision of outsourced water and energy services (Marino et al. 2010). The French municipalities first delegated the distribution of water to private companies already in the 19th century. This approach of delegation was slowly extended to heat production and distribution (district heating) (Duplessis et al. 2012). Energy services in the public sector started to dominate in 1937 (Duplessis et al. 2012), and it was built on the public service culture in France, hardly known in other parts of Europe. These long-term agreements developed into –what is referred to as today – the “chauffage” contracts, which then spread to other European countries, too, forming an ESCO approach different from the classic EPC.

Today France hosts many of the most crucial international ESCO giants.

Current ESCO market

The French ESCO market is known to be large, stable and even growing with a noteworthy pace.

The first EPC project to renovate private social houses using TPF, Schiltigheim in the region of Alsace



In 2011 an ESCO project was initiated to save 46% energy (guaranteed by an ESCO based on a careful 2 year audit and baseline) in a French condominium of 64 apartments in 4 buildings owned by a private housing association and rented out to tenants.

The project applies an outsourcing agreement with a saving guarantee, and includes several renovation aspects not related to energy performance (plumbing, replacement of floors and walls, increasing safety and user-friendliness of common areas, etc.).

Awareness raising and demonstration of results is also part of the programme, which are financed by the Intelligent Energy Europe programme and local communities. In addition, locally specific sources are added, such as tax rebate and the income from White Certificates. The cost savings from energy renovation are collected through the unchanged lease agreement between the housing association and the tenants.

Source: Bullier and Lefevre (2011)

The total number of ESCO-type companies is 350, with no more than 10 ESCOs focused on strictly speaking guaranteed agreements (EC JRC 2012). However, Duplessis et al. (2012) emphasize that the number of ESCO companies and the volume of ESCO projects in France are underestimated by international analysts due to the market specificities, i.e. because there is a significant volume of management projects, which often include only minor clauses for guaranteed energy savings or comfort supply.

Until the early 2000's energy producers were large national companies that were prohibited to offer energy services in order to avoid unfair concurrence (Leroy and Chanussot 2009), and thus energy services were carried out by two large, independent holdings (also active in other services, such as waste management). With the liberalization of the market, the companies traditionally dealing with energy supply also got engaged in energy services.

Today, the French ESCOs are still typically large international and national companies, who carry out these services in addition to other activities, such as facilities management, energy production or installation. Some of these companies reduced their activities before 2009 due to limited demand (Marino et al. 2010), but are now refocusing on energy service supply. Furthermore, already during 2005-2010 small local and specialized new entrants, such as equipment manufacturing firms or companies managing white certificates and subcontracting all the technical implementation could appear on the market, driven by new market opportunities (Marino et al. 2010; Bertoldi, Boza-Kiss, and Rezessy 2007), and this trend continued during 2010-2013 as a result of the white certificates system and other supportive changes in the legal environment (see below). Despite these new companies, the dominance of the large ESCOs with long history is not challenged (EC JRC 2012).

A market volume of minimum €75-100 million per year has been estimated by experts for EPC projects only⁵⁹, which incorporates the costs of complete contracts, including audit, measure implementation and M&V for public sector projects (EC JRC 2012; Duplessis et al. 2012). When taking into account all ESCO-type projects, the market volume has been calculated as €3.2 billion (Duplessis et al. 2012)⁶⁰. On the other hand the market potential is around €250-500 million for EPC and around €5 billion for all ESCO projects (EC JRC 2012).

Different types of ESCOs are represented by a number of associations. An association with broad coverage of energy efficiency services, called Club S2E, was co-founded in 2005 by five of the main professional associations (Vreeken, Worrell, and Houwing 2012), namely:

- FEDENE (Fédération des Services Énergie Environnement)⁶¹ (which was FG3E before 2009), a union of historical ESCOs and it is the most influential one;
- GIMELEC, an association of equipment manufacturers and suppliers that provide energy services in addition to their core activities and thus refer to themselves as ESCOs;
- SERCE, the Union of electrical engineering companies;
- UCF, a subgroup of the French Federation of Buildings, uniting environmental engineering companies; and
- UFE, the French Union of Electricity.

⁵⁹ Other experts interviewed for the current study suggest that the potential is higher.

⁶⁰ See a detailed analysis and description of the distribution of costs in Duplessis et al. (2012)

⁶¹ see <http://www.fedene.fr/>

Types of projects

The traditional target sector of ESCOs in France has been the public building sector. The National Energy Efficiency Action Plans of France indicate a commitment to expand the ESCO market to the industrial, the service and also the residential sectors (Ministry of Ecology, Sustainable Development, Transport and Housing and Ministry of the Economy, Finance and Industry 2011).

The industry received some attention already before, however contracting is limited because industrial partners do not represent a long-term reliable client (EC JRC 2012). Nevertheless it is not unusual to offer energy services in combination with O&M and regular energy supply. Some very large companies (e.g. car manufacturers or large retail firms) engage in long-term contracts (5-10 years) which involve energy improvement strategies in the framework of rewarding strategies (EC JRC 2012).

The residential sector is a new possible target of EPC, which has started to emerge, primarily in the case of social housing (both private and public) (Bullier and Lefevre 2011), partially because of the available financial incentives and income from the White Certificates (EC JRC 2012; Ministry of Ecology, Sustainable Development, Transport and Housing and Ministry of the Economy, Finance and Industry 2011).

Originally France was known for its almost exclusive use of "chauffage" or "contract energy management" (CEM) type contracts, whereas energy services are based on the combined operation and maintenance of HVAC systems. This translates into a long-term commitment to provide an agreed comfort service (e.g. heat, ventilation, etc.), but without explicit obligation to energy efficiency investments and improvements. Comfort services are usually offered at a discounted price and include the energy supply (Marino et al. 2010).

The success of the "chauffage" contract in France lies with the strict standardization of the contracts in the framework of public procurement, which leaves little for negotiations, but on the other hand ensures a reliable and accountable service as well as compensation on the side of the client.

Since the 1980's, the standardized "chauffage" contracts are concluded in 4 variants, referred to as P1, P2, P3 and P4. These 4 alternatives are associated with different prices, different VAT rates, and the distribution of the invoice between owners and tenants or occupants in accordance with the law, and finally the length of the contract, the share of costs between the ESCO and the client, and the level of guarantee (Duplessis et al. 2012; Marino et al. 2010). The four types of contracts are (Leroy and Chanussot 2009; Duplessis et al. 2012):

- P1 contracts cover the fuel supply without explicit obligation for energy savings and guarantees;
- P2 contracts include the daily operation and also operation services (tuning, advice, etc.);
- P3 contracts incorporate full maintenance, including major repairs and the supply of materials, where an energy efficiency improvement comes from the prompt replacement of malfunctioning equipment; while
- P4 is a complex energy efficiency improvement contract, with a focus on the purchase of new equipment. However, this type of contract has been prohibited in the public sector, due to the public accounting rules that revolve around a yearly expenditure rate, and the separation of investment and operation budgets. These restrictions have been resolved through the Grenelle laws (see below) and the possibility of public-private-partnerships for building renovation, which is probably the most important change in France regarding ESCO contracts in the period 2010-2013.

Due to the legal changes, EPC is becoming more known and used. In fact, the terms “energy service” and “Energy Service Company”, were largely unknown until the late 1990s, when they spread due to the liberalization of energy markets and the use related to EU directives, such as the Energy Service Directive (BioSolESCO project 2013).

In recent years, energy service contracts have become more and more complex, integrating a number of relevant services, such as audit, financing or M&V into the traditional “chauffage” offer (EC JRC 2012). Also, individual contracts have more global coverage, for example, combine building insulation and equipment refurbishment instead of doing these separately (EC JRC 2012).

The Prebat research program identified three main types of EPC contracts (Leroy and Chanussot 2009):

Type A: to cover running, maintenance, energy purchase, whereas the profit is shared based on performance. The contract includes no investments, energy savings can be expected in the range of 5 - 15 % with contract duration of 1 - 8 years;

Type B: to implement investments on equipment, includes energy monitoring, energy performance guarantee, and may or may not incorporate the services of Type A. Energy savings reach 15 - 25%, with a payback time of 3 - 15 years;

Type C: to ensure building renovation, potentially including the investments of Type B and/or the services of Type A, combined with an energy performance guarantee. The savings shall be more than 25% with a payback time longer than 15 years.

Regulatory factors

As indicated above, until 2009-2010 there were significant regulatory barriers to complex and therefore more effective ESCO projects in the public sector (mainly through the public procurement laws) that were resolved and slowly transferred into a rather supportive environment, which has peaked lately with the Grenelle laws in 2009 and 2010.

Firstly, the core importance of Grenelle 1 is the commitment to ambitious energy goals, including the quartering of CO₂ emissions by 2050, an average reduction of final energy intensity of at least 2% per year from 2015 and of 2.5% from 2015 to 2030, and the production of 10% of energy needs from renewable energy sources by 2010. Regarding buildings, there is a quantitative objective of a 38% decrease of the energy consumption of buildings by 2020, as well as the development of EPC for condominiums and local authorities – besides many other actions and objectives. Given that the State, the public institutions and the local authorities will not have the full financial means to carry out these objectives with internal budgets, they will look for solutions that will not impact on their investment budget. (Leroy and Chanussot 2009; Berliner Energieagentur GmbH 2012a)

For private co-ownerships with a collective heating (or cooling) system Article 7 of Grenelle 2 introduces a requirement to propose the design of an EPC (or an energy-saving work plan) following obligatory audit (Ministry of Ecology, Sustainable Development, Transport and Housing and Ministry of the Economy, Finance and Industry 2011).

The Grenelle laws introduced the requirement for the public procurement laws to be amended to allow EPCs in the public sector, through the possibility to have global contracts including design, construction

and operation only if energy savings are guaranteed (but without third part financing)⁶² (Ministry of Ecology, Sustainable Development, Transport and Housing and Ministry of the Economy, Finance and Industry 2011). The procurement regulations were then published in 2011 and 2012 (Berliner Energieagentur GmbH 2012a). These procedures led, during the very past years, public works major to turn into EPC business in the framework of first experiences of EPC for global comprehensive refurbishment of public buildings (Duplessis et al. 2012). Furthermore, the public procurement law now requires the inclusion of environmental factors in the procurement procedures, and an active demand-side management policy by local authorities is ongoing and provides space for consideration of EPC or other ESCO services (Boonekamp and Vethman 2010).

The role of White Certificates system has been a subject of controversy, nevertheless based on the comparison of opinion and experiences, the ESCO market can be seen as a beneficiary of the system, already in the first period (Marino et al. 2010), and even more in the second period, starting in 2010 (Broc et al. 2010), when EPC has been explicitly linked to the system and has impacted primarily on the residential, the service sector and the industrial projects (Duplessis et al. 2012; EC JRC 2012).

Market factors

The noteworthy development of the ESCO market in France during the last years is a result of the changing legal environment, and less to the changes in the market conditions. The notable changes in the market are the increased interest in EPC as opposed to the focus on “chauffage” only before, the movement towards smaller sectors, more complex projects and projects that include efficiency investments even in the public sector. The role of external financing has grown, though still insignificant compared to the use of internal budgets.

As of today, energy audits are financially supported by the French Environment and Energy Management Agency, ADEME⁶³. These supported audits are combined with ESCO services, because using the results of the subsidized audits, ADEME can assist the potential customer in writing the call for tenders and selecting the best ESCO to implement the energy efficiency improvements in the given buildings.

Awareness and trust

There are many types of actions directed at awareness raising, information dissemination and lobbying in France. The main activist in support of information on energy efficiency and EPC/ESCOs is ADEME, primarily through its eco-citizen web-site.

The various associations are all active in promotion and information dissemination, for instance, Club S2E collects good practices and prepares policy recommendations (Leroy and Chanussot 2009). Gimelec has been active in information dissemination and has published guides on energy efficiency.

Model contracts and guidebooks on procedures for EPCs have been developed in recent years. MAPPP (Support Force for Public-Private Partnerships) published a model contract in March 2010 adapting EPC in the context of renovation of public buildings, to partnership contract procedures. Additionally, the

⁶² Before these changes, PPP (public–private partnership) commitment was a possible solution for similar energy efficiency improvements, but only if the project was sufficiently ‘complex’ in the legal sense.

⁶³ The scheme may change as a result of the Energy Efficiency Directive, which requires mandatory audits for certain users. The financial support is currently questioned in France (EC JRC 2012).

Ministries responsible for energy published a guide to EPCs relating to public works in July 2010, in order to provide support and clarification for public actors wishing to use EPCs (Ministry of Ecology, Sustainable Development, Transport and Housing and Ministry of the Economy, Finance and Industry 2011).

France has introduced a so-called “reference system for energy efficiency services”, which facilitates the functioning of ESCOs and other providers of EES (Boonekamp and Vethman 2010).

Information dissemination and motivation of banks is seen as inevitable for further market growth and maturation because even traditional ESCOs are less and less willing to finance projects from their internal budgets, which can reach their on-balance sheet limitations and freeze the markets (EC JRC 2012)

Financing ESCO projects

The French ESCO market is dominated by large, creditable companies that have the internal financial means to finance projects if necessary, thus the role of banks is limited (BioSolESCO project 2013). The concept of TPF (Third Party Financing) was tested very early in France (1986) but did not generate a real market. Accordingly, the role of TPF in ESCO projects and public funds has been lower than in other countries, even though both of these sources are known and used to a limited extent for the relevant (less profitable) sectors (BioSolESCO project 2013). On the other hand, experts suggest that further market expansion will be possible only if TPF becomes more popular, because ESCOs have their on-balance sheet limitations, and even large companies are now more and more reluctant to continue to finance projects themselves and are looking for off-balance sheet solutions (EC JRC 2012).

The ESCO market is aided by the available subsidy forms. ADEME, in cooperation with the French development bank, created a Crediting System in Favour of Energy Management (FOGIME - Fonds de Garantie des Investissements de Maitrise de l'Energie), which is a guarantee fund for loans for investments in sustainable energy and renewables in the private sector. This is a particularly beneficial form of support based on other countries' experiences, too (Berliner Energieagentur GmbH 2012a).

Barriers

The most important barrier is the massive gap between the investment capacity of the public sector, worsened by the financial restrictions due to public budget contractions (EC JRC 2012), and the investment needs prescribed by the Grenelle laws to fulfil the objectives (Duplessis et al. 2012). While building owners and managers have become used finance efficiency improvements from their own or the ESCOs own equity, with the drastically larger investment requirements this will become impossible. At the moment, this gap is seen as a barrier to ESCO projects because an investment partnership is essential to overcome the gap, but public bodies are afraid of Public-Private-Partnership and the payback time for envelope refurbishment is often too long to attract private investors.

Today, there are many discouraging examples, where energy services have been poorly implemented, and increase the lack of trust in the formula (Leroy and Chanussot 2009). Equipment investments have been traditionally only implemented when absolutely necessary, thus little attention was given to the improvement of energy performance.

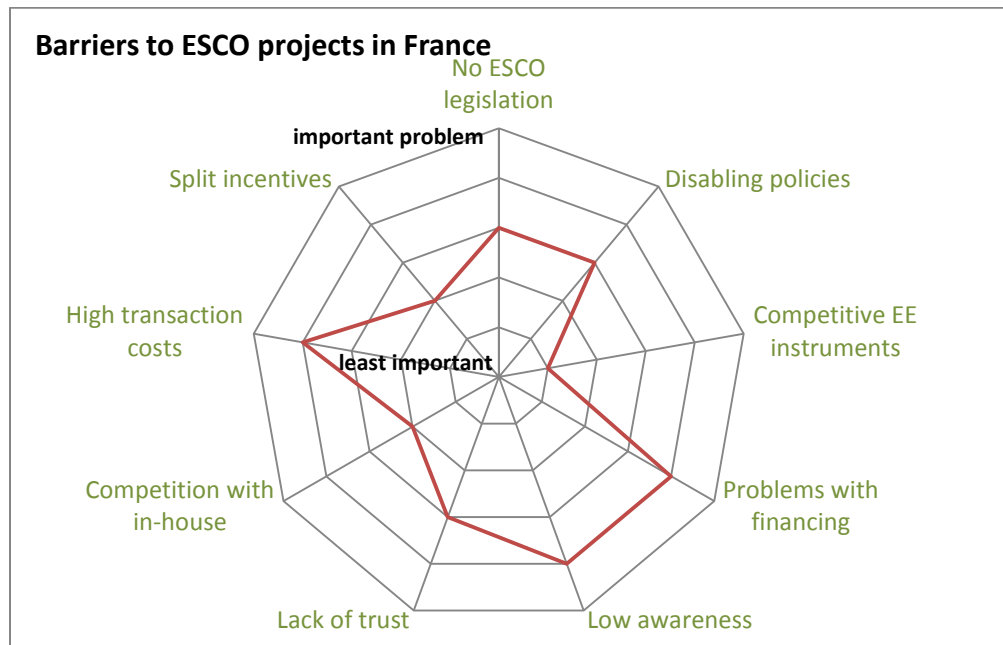
Nevertheless, it is expected that later exactly this market gap will open an important niche for different ESCO operators and the EPC market will grow. Other solutions (for instance, in the regional Council of Rhone-Alpes) include the setting up of public ESCOS to support and finance advanced EPC projects similar to the Belgian FEDESCO (Berliner Energieagentur GmbH 2012b).

It is also problematic, that actual implementation of actions or even the implementation plan is delayed, often for years, after an (obligatory) audit is done. This is expected to be partially overcome by obligations to conclude the efficiency improvements.

Transaction costs are considered to be large in EPC projects (EC JRC 2012). This is a relatively new market area and the new entrants are in a learning process, which is aggravated with a lack of standardisation and lack of data, especially in the more particular sectors, such as the services and residential sectors (EC JRC 2012).

There is a growing need for information dissemination and spreading information about successful projects and their application to new areas, new projects.

In summary, the following graph illustrates the relative importance of barriers in France:



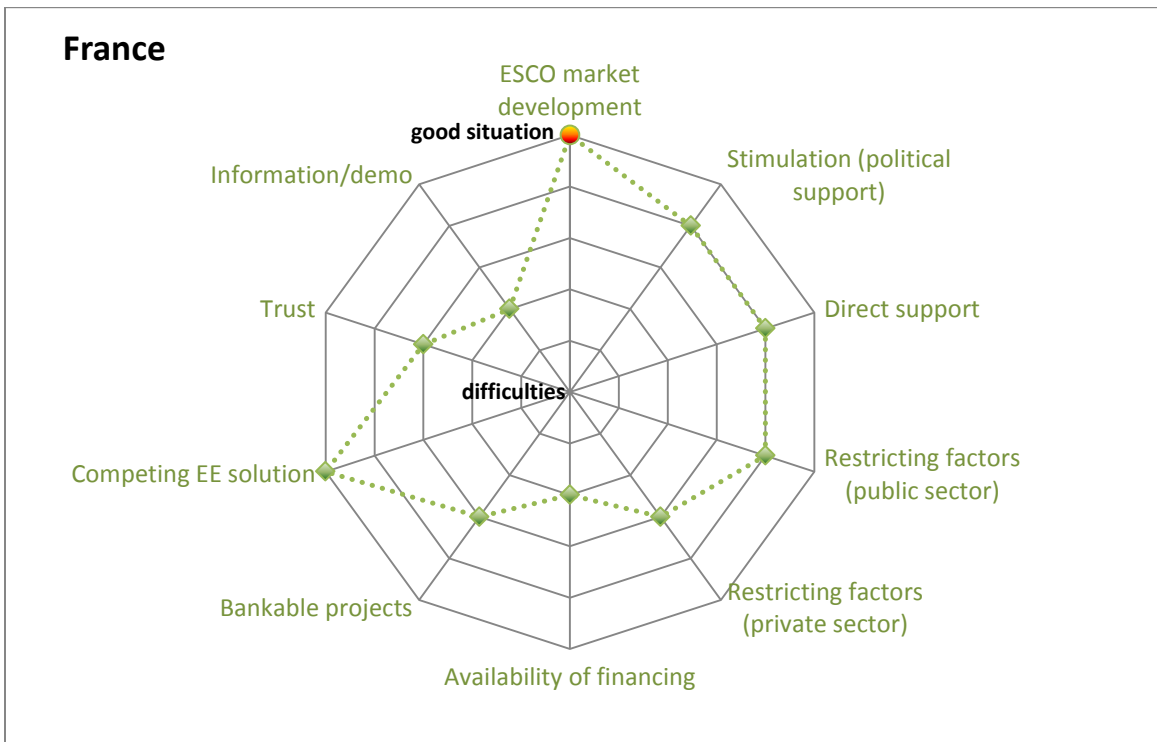
Conclusions and future expectations

The French ESCO market can be described as a peculiar, but successful, large and effectively growing market, although ESCO experts highlight that the market is far from booming (EC JRC 2012). The traditional, large ESCOs have proven to be very effective and create a large market. In the recent period, the changes in the EU environment and the national commitments, as well as the interest of new entrants, facilitated by legal changes prove that it was possible to transform even this traditional market. It can be expected that the French ESCO landscape will look very different within a few years. New entrants and new niches also have an effect on the old ESCOs, who are willing to adapt to the changes, and seem to carry on their dominance successfully.

Key drivers

- The Grenelle laws, including overall targets and direct EPC promotion;
- Transformation of the barriers in public procurement into a rather supportive system;
- Active ESCO promotion, existence of active and varied associations;
- Obligatory audits and other regulatory factors about 10 years ago, which still insert their effects;
- Possibility to combine various EE measures, such as audits, tax rebates, and White Certificates;
- Interest from small, new players.

The following graph shows the key features of the French market:



France in a snap-shot:

Number of ESCOs	350 ESCOs, of which 10 large companies offer EPC/guaranteed savings
ESCO market size and potential	<p>market size (including audit, measure implementation and M&V costs):</p> <ul style="list-style-type: none"> • €75-100 million (EPC type projects), • €3.2 billion (all ESCO type projects), <p>market potential of EPC: €250-500 million and €5 billion for all ESCO projects</p>
ESCO market trend	stable, with market transformation and growth, and extension to new target areas
ESCO association	yes, several
Typical ESCO projects	public sector buildings HVAC
Main type of contract	chauffage, but EPC's role is becoming larger though still incomparable

German ESCO market 2013

Germany has been seen as the champion amongst the European ESCO markets in terms of maturity and the number of stakeholders. (Marino et al. 2010) Germany remains to be a frontrunner during the period 2010-2013, when the German ESCO market has been undergoing a slight change of direction towards more private sector projects, more large international and especially national providers that have larger geographical scope than before, and a continued, even increased role of facilitators (agencies and associations) (EC JRC 2012; MPW Institute LLC 2013). All in all, the German market continues to grow slowly and is expected to exert further moderate increase until 2020.

Current ESCO market

The number of companies supplying energy supply contracting (ESC) and/or energy performance contracting (EPC) today is put at 500-550, which includes energy companies, ESCO companies, engineering companies and other suppliers (Seefeldt et al. 2013). However, for less than 30% of the companies, revenues from energy supply contracting and/or energy performance contracting sum up to more than 30% of their total turnover⁶⁴, for about 60% of the companies the ESC/EPC revenues are less than 5% of their total turnover (Seefeldt et al. 2013; Wargert 2011). Around 10 companies are strictly focused on EPC (EC JRC 2012). The total market has continued to increase during the observed period of 2010-2013. Majority of the companies interviewed for a large-scale study expect moderate, but steady growth until 2020⁶⁵ (MPW Institute LLC 2013).

The overall composition of the market has not changed much in the last 5-10 years. Energy supply contracting (ESC) is dominated by building, equipment and control manufacturers, engineering firms, facility management and operation companies and energy companies. Most of them are international companies. Recently more local and regional energy companies have entered the market due to an increased interest by customers in energy efficiency activities fostered by increasing energy prices (EC JRC 2012), changing energy supply structure (towards decentralisation (MPW Institute LLC 2013)), national and European legal changes (MPW Institute LLC 2013; Seefeldt et al. 2013), including a possible future energy efficiency obligation scheme (EC JRC 2012). About 200-300 utilities are expected to have the willingness and ability to comply with the obligation of providing energy services out of the ca. 1000 companies. Therefore, about 700-800 utilities will find other ways to fulfil the obligations (EC JRC 2012). Small ESCOs sometimes struggle due to uncertainty in the legal environment (see below) and due to competition (EC JRC 2012).

Large international companies or their daughter companies are the main actors in the energy performance contracting market. The framework conditions for their business have not improved during the last years. Further suppliers of energy performance contracting include project developers, financing institutes and craftsmen. Public ESCOs do not operate in Germany. (EC JRC 2012)

In total, the market volume for energy efficiency services in Germany in 2012 was estimated to be €3.5-5.0 billion/a (Seefeldt et al. 2013). This revenue is mostly the income generated by ESCs (EC JRC 2012). On average, about 8% of the total income is generated by EPC (Seefeldt et al. 2013). The market volume has increased significantly since 2010 when it was estimated to be €1.7-2.4 billion/a with regard to energy supply contracting and energy performance contracting (Marino et al. 2010). It is expected to

⁶⁴ Wargert (2011) concluded that less than 250 companies offer ESC as a core service in their portfolio.

⁶⁵ 85% of the surveyed companies expect the market growing, of which about 1/3 assume a growth larger than 10% per year, and 2/3 foresee a more modest trend.

further increase in the coming years, continuing the unbroken growth since its start in the early 90s (EC JRC 2012; MPW Institute LLC 2013).

The market potential is around 10 times larger, i.e. €20-30 billion/year, referring to the total revenue from energy services, including energy costs (EC JRC 2012).

Personal communication, networking, advice and further support by energy agencies and other facilitators play crucial role in the German market (EC JRC 2012; Bleyl-Androschin, Schenker, and Vanstraelen 2013). Energy agencies help municipalities in conducting public procurement for ESCO services. Moreover, there are several associations in Germany that represent ESCOs, including VfW (Association for Heat Supply), ESCO Forum (ZVEI national association for electrical and electronics industry), BDE (Bundesverband Deutscher Energiedienstleister - Association of German Energy Service Providers), Forum Contracting e.V. (Association of persons active in the field of energy contracting), VDMA (National Association for machinery and industrial equipment manufacturers, subgroup for Building Automation), AGFW (Association for District Heating & Contracting), and DENEFF (Deutsche Unternehmensinitiative Energieeffizienz e.V. - the German Industrial Initiative for Energy Efficiency).

Types of projects

Approximately 80-85% of all German ESCO projects are in the form of energy supply contracts, 8-10% of the market is covered with EPC. "Chauffage" is not common, mostly due to the low share of district heating⁶⁶. The rest of the projects involve financing only or they are based on operation contracting, and other less complex solution (EC JRC 2012). The shared savings model is dominant (i.e. investment free for customers), which would not be available for large investments on their own (Wargert 2011).

ESC projects are smaller, mostly in the range of €20,000/a, and they target mainly the public sector (government and municipal buildings), but they are also concluded with private clients (offices, commercial buildings, industry, residential sector, etc.). They produce around 15-20% of energy savings⁶⁷, and are based mainly on fuel switching and the installation of renewable energy sources, i.e. more on carbon emission reduction than on end-use energy consumption reduction (Bleyl 2012).

EPC and RES combination



Public buildings in the District Steglitz-Zehlendorf in Berlin were refurbished using the so-called integrated energy contracting, which is the Berlin Energy Saving Partnership model combined with RES. The project involves the installation of new boilers in several buildings, fuel switch from heat oil to gas, renovation of building automation, modernisation of lighting combined with the installation of renewable technologies (solar thermal systems and a wood pellet boiler) in a pool of 69 properties (schools, kindergartens, gyms).

Total investment volume: ca. €2.9 million

Guaranteed energy savings: 29,4% = €541,681/a compared to a baseline of €1.84 m/a

CO₂ reduction: 3,973 t/a

Contract duration: 14 years

Source: Bittner (2012) and Berlin Energy Agency

⁶⁶ 14% of occupied accommodations (euroheat4.eu)

⁶⁷ compare with EPC described below

EPCs were established in the public sector, primarily used for the refurbishments of administrative buildings, hospitals, swimming pools, social housing, educational facilities (schools, universities, museums), while less popular, nevertheless existent in the service sector, e.g. in hotels. The model was introduced in the German market by the Energy Saving Partnership (ESP) in Berlin in 1995 by the Berlin Energy Agency (BEA, Berliner Energieagentur). The ESP continues its success with over 1400 buildings being renovated since its start (Wargert 2011), however does not expand further significantly in the public sector (EC JRC 2012). On the other hand, its use is spreading generously in the private tertiary sector recently and is expected to reach a volume equal to the public sector (EC JRC 2012). These projects often include elements that are not core business (lease, rent, sale lease back). The industry utilizes EPC, too, even if this is not as common as in the case of buildings (EC JRC 2012). Typical project sizes are larger than €150,000/a of energy cost baseline and energy savings may reach 20-25%, or even 30-50% (Bleyl 2012; EC JRC 2012). It is interesting that the geographical distribution of EPC implementation is very uneven. Except from Berlin, Federal States ("Länder") in Eastern Germany have not been active users. The differences may be due to the locally established trust (proven experience bringing more projects) and due to the local level of energy service infrastructure and facilitators, i.e. energy agencies, consultancies. Furthermore, Federal States can have their own local policies, which in some cases are more supportive of ESCOs.

Due to a growing pressure to provide demand side solutions (too), the so called "integrated energy contracting" (IEC) model receive growing attention⁶⁸, where RES and energy efficiency solutions are combined in one project to achieve higher cost savings (Bleyl 2012; Wargert 2011; EC JRC 2012). IEC has been developed particularly for the German and Austrian market, and is expected to compete with EPC because of the complexity of the latter (Wargert 2011). However the future success of IEC cannot be predicted yet due to its novelty.

Figure 4. compares the benefits of different types of ESCO projects (EPC, ESC and IEC) used in Germany, based on 50 real ESCO projects. EPCs have the capacity to result in the largest cost savings because of the investment rate and the resulting energy savings, whereas ESCs have a larger CO₂ mitigation potential, but cost more due to the still expensive technologies that are applied.

⁶⁸ We can observe similar changes in other countries, e.g. in Greece – see the chapter on Greece in this report.

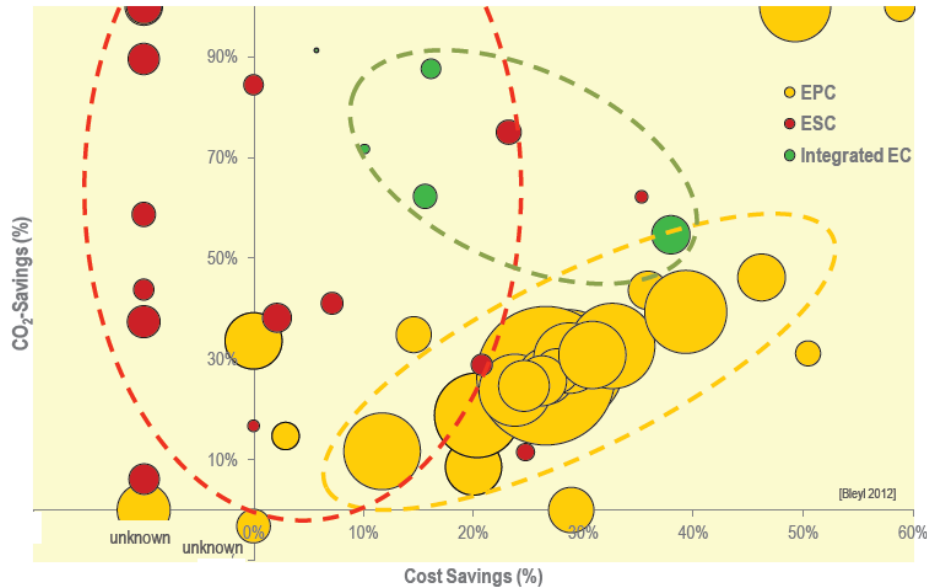


Figure 4.: CO₂ and energy cost savings analysed in 50 ESCO projects in Germany. *EPC = energy performance contract, ESC = energy supply contract, Integrated EC = energy improvement contract applying RES and energy efficiency solutions together.*
Source: Bleyl (2012)

Rooted in the type of contracts dominating the German market, the technologies most commonly targeted by the ESCO projects are heating and hot water supply, renewables and CHP. Public lighting, control and automation and pumps are also very frequently refurbished. Projects to improve industrial processes, industrial cooling, motors, inverters, indoor lighting, air conditioning and ventilation are less common, together with building shell and whole building refurbishments (EC JRC 2012).

Regulatory factors

National and European legislation are considered as key movers of the ESCO market (MPW Institute LLC 2013; EC JRC 2012), and the European directives are considered as “trendsetters” (MPW Institute LLC 2013). On the other hand, while the German legislation is believed to be very supportive of energy efficiency and renewables, ESCOs claim that the regulatory framework is also a main barrier, when there are inconsistencies and clarity is low (EC JRC 2012).

The Renewable Energy Act disadvantages energy service contracting in comparison with owner-operation of heating installations such as small scale CHP (EC JRC 2012). While owners are released from the payment of the renewable energy assessment, when the operation is performed by an ESCO, the owner is obliged to pay the renewable energy assessment (EC JRC 2012). On the other hand the Renewable Energy Act does not only promote RES, but emphasizes the combination of energy efficiency and renewables. This will further strengthen ESCOs, in particular those that can offer IEC (Wargert 2011; Bunse et al. 2010).

The tenancy law used to be a major obstacle because the building owner could not pass on or share the contracting fee for energy services to the tenant without a permission by all tenants (Boonekamp and Vethman 2010; EC JRC 2012). From July 2013, this problem has been resolved by the German Civil Code. Switching from owner-controlled heating to an energy services model is now possible without permission by all tenants, if the efficiency is improved and the cost for the tenants is unchanged. However, there the methodology of cost comparison is not yet resolved (EC JRC 2012).

Furthermore in some Federal States a statutory provision prescribes a preliminary economic comparison of an EPC offer with self financing. The problem is, however, that there are no consistent and legally prescribed standards (or experience) on such calculation of economic comparisons (Berger and Schäfer 2009). Public procurement law is also too complex and dealing with ESCO projects is difficult and complicated (EC JRC 2012).

The ambitions for the phasing out of nuclear energy and for major energy supply restructuring seem to open a large niche for energy services by increasing the economic feasibility of ESCO projects (Wargert 2011). Decentralisation is considered as an interesting possibility to expand their markets for ESCOs (MPW Institute LLC 2013).

There are a number of quality standards that contribute to the definition of the energy efficiency services supplied, for instance (Berger and Schäfer 2009):

- DIN EN 15900: Guidelines of energy efficiency services (03/2009)
- ISO 50001: Energy management systems - Requirements with guidance for use (04/2012)
- VDMA 24198: Terms and services of Energy Performance Contracting, explains the stages of project development and gives criteria for the assessment of EPC services.
- DIN 8930-5: Definition of different types of contracting (11/2003)

Market factors

The EPC market is clearly demand driven in Germany and there are more clients interested in using these services, primarily in the private sectors. Nevertheless new clients often face the difficulty with the complexity of the ESCO contracts/projects and get discouraged (EC JRC 2012). Experts believe that the role of facilitators (agencies, consultants) is very important in case of the EPC part of the market in order to help clients navigate through project initiation and management.

The main driver of the ESCO market is the energy price increase and especially the expectation of tjis continued increase (Seefeldt et al. 2013).

The spread of smart technologies and the role ESCOs can have in marketing these contributes to the growth of the ESCO market. In addition, the more smart technology is used in buildings and facilities, the better services at a lower cost can be offered by ESCOs. Therefore, the market players expect that this will be the main leader in future market growth and market specialization (MPW Institute LLC 2013).

Awareness and trust

There are a number of stimulus programmes, which have a long tradition in some parts of Germany, for example training of managers, architects and operators. Local actions and initiatives may be even more effective, promoted by the Federal States. Information dissemination is also typically dependent on the geographical area, and is largely in the hands of the local energy agencies. Nevertheless national agencies and associations are also very active, for example the German Energy Agency.

Voluntary initiatives by ESCO associations enabled standardisation of energy service contracts for different energy efficiency technologies and procedures and documents such as model contracts have been prepared (Boonekamp and Vethman 2010). A selection of guidelines for performance contracting in public buildings are as follows (Berger and Schäfer 2009; EC JRC 2012):

- Hessisches Ministerium für Umwelt, ländlichen Raum und Verbraucherschutz (2012) Leitfaden für Energiespar-Contracting in öffentlichen Liegenschaften
- UBA (2000): Energiespar-Contracting als Beitrag zu Klimaschutz und Kostensenkung – Ratgeber für Energiespar-Contracting in öffentlichen Liegenschaften
- UBA (2002): Contracting für kommunale Sportstätten – Strategien zu Klimaschutz und Kostensenkung – Leitfaden
- Deutsche Energie-Agentur (2008): Leitfaden Energiespar-Contracting – Arbeitshilfen für die Vorbereitung und Durchführung von Energiespar-Contracting in Bundesliegenschaften
- Deutsche Energie-Agentur (2008): Contracting-Lotse für Kommunen
- Leitfaden Contracting des Bundeslandes Bayern (2012).

Financing ESCO projects

There are a number of financial incentives for building refurbishment and for RES application, and these are available for ESCOs and for building owners alike, though not equally (EC JRC 2012). Financial support programmes for energy audits have also been effective in moving the ESCO market ahead (Boonekamp and Vethman 2010).

Nevertheless, many projects run without grants. As indicated above, the shared savings model is the most preferred format, where the ESCO or a third party provides the upfront costs. Because of the lack of internal funds and difficulties to access preferential loans, municipalities resort to outside financing. Often, these entities would be able to and willing to engage in an energy performance renovation on their own, however they establish partnerships with ESCOs in order to ensure the financing of the energy efficiency measures (Wargert 2011). They also benefit the easier and faster project management (EC JRC 2012). Accordingly banks are active in ESCO project financing through TPF. Forfeiting⁶⁹ started to draw attention to EPC projects in the period 2000-2005, and is a common practice now in Germany. It involves the long-term sale of (future) receivables, i.e. the bank wires the costs (of the equipment, hardware) to the ESCO at the time of completion of the project set-up, when the equipment has been installed. The customer is obliged to complete the periodic fixed payments to the bank based on an agreement directly⁷⁰ between the bank and the customer. In normal EPC projects, around 5% of the total guaranteed savings are backed up by a bank guarantee, as opposed to forfeiting, where this increases to 10% (EC JRC 2012).

Due to the crucial role of market facilitators in the German ESCO market to help clients that are less experienced and that can participate in a project only based on proper advice, experts suggest that financial support would be inevitable for them (besides other state support) (EC JRC 2012; Bleyl-Androschin, Schenker, and Vanstraelen 2013).

Barriers

While the legislative framework, including implementing measures, are more advanced than in many other European countries, ESCOs complain that it is often unclear and inconsistent (EC JRC 2012). In particular, ESCO projects face problems due to the complexity of procurement regulations and with the Renewable Energy Act. Tender specifications for public sector projects are sometimes unclear and of low quality, especially when the existing and available guidelines are not followed (Boonekamp and

⁶⁹ also referred to as factoring

⁷⁰ indirect payment is also possible, but not common

Vethman 2010; EC JRC 2012). On the other hand, the complexity of EPC has discouraged many new clients, and opened the market towards supply contracts or IEC.

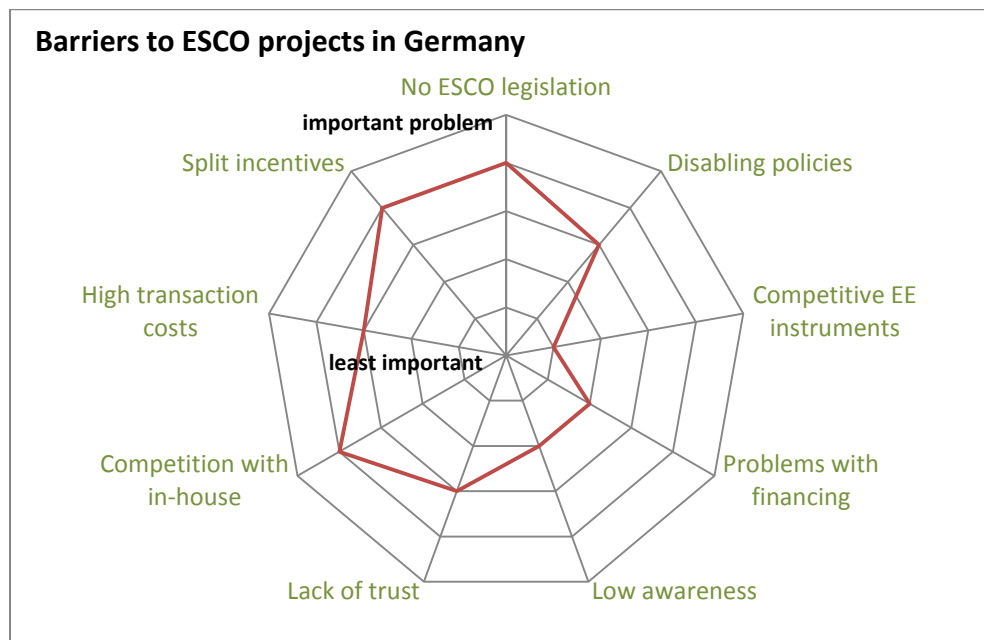
Competition is large, partially from other companies, utilities that may not focus on the profitability of their energy service provision, and also in-house energy managers of municipalities and experts from energy agencies carrying out energy efficiency activities (Boonekamp and Vethman 2010).

As opposed to other countries, where banks are reluctant to engage in ESCO projects due to the small number of projects (and thus limited knowledge, experience and trust), in Germany the problem is the opposite: with the growing volume of ESCO projects, ESCOs and customers alike reach their credit line limits and credit liabilities burden balance sheets (Bunse et al. 2010).

At the same time, risk aversion is rather high, and thus the shared savings model has gained popularity. Experts have suggested that setting-up energy funds to support transaction costs or as a security backup could also be considered (Berger and Schäfer 2009).

Finally, there is still suspicion against ESCO offers by potential clients, in spite of the long-established tradition of energy services and broadly used and much standardised contracts. Known ESCOs, local companies with proven successes have a significant edge on newcomers (Wargert 2011).

In summary, the following graph illustrates the relative importance of barriers in Germany:



Conclusions and future expectations

The German ESCO market continues its lead amongst the European markets. The number and volume of ESCO projects is constantly increasing. The general consensus holds that a moderate growth will continue because of the remaining large economic saving potential of the country, (expectations about) increasing prices, supportive regulatory framework, and due to the spread of the use of renewable energy, in particular CHP, and even more as a result of smart technologies (Seefeldt et al. 2013; EC JRC 2012; Bunse et al. 2010; MPW Institute LLC 2013). Both Wargert (2011) and MPW Institute LLC (2013) found that ESCOs expect a moderate but continuous increase per year in the future. However, the future development of energy performance contracting will strongly depend on the development of

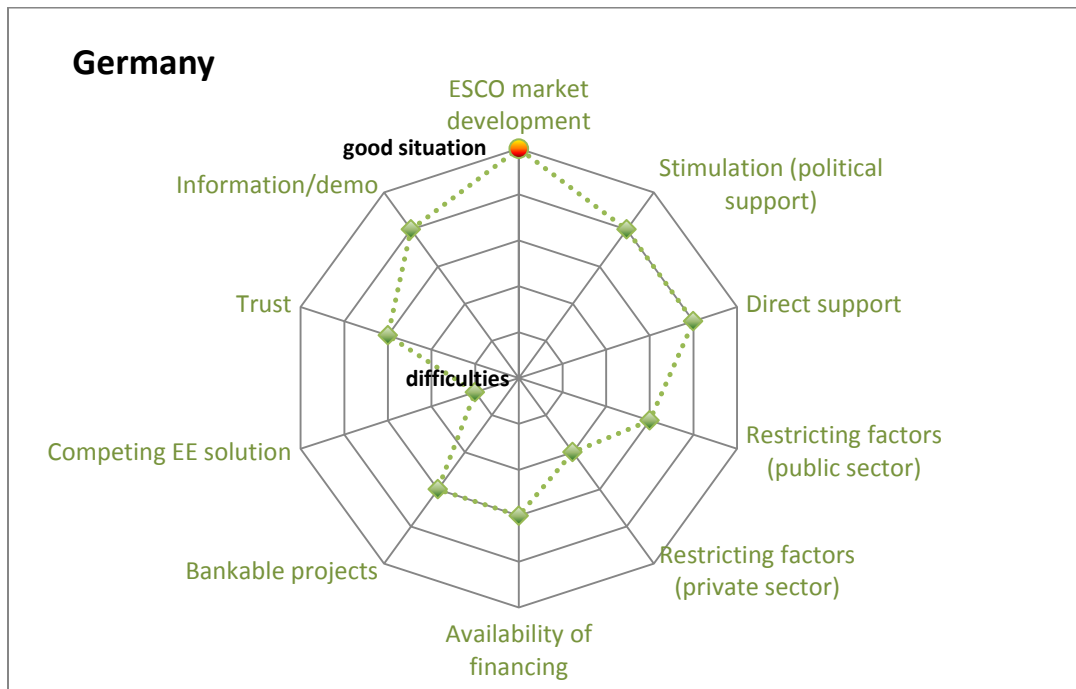
framework conditions and the provision of support by market and project facilitators (EC JRC 2012; Bleyl-Androschin, Schenker, and Vanstraelen 2013).

In the period 2010-2013 a small transformation of the structure of the market could be observed. The awareness of a potential introduction of an Energy Efficiency Obligation induced some utilities to offer energy services, although the majority is not prepared for such a business change yet. In parallel, small ESCOs find it difficult to deal with market competition. The legal environment is relatively supportive; however ESCOs find it also a major barrier.

Key drivers

- Expectation of increasing energy prices;
- Clients' lack of capital or access to competitive loans by the clients;
- Established trust, demonstration projects;
- Support by facilitators (energy agencies);
- Political commitment for energy efficiency and renewables, ambitious energy and carbon targets, nuclear phase-out;
- Standards and standardized contracts;
- Large energy efficiency potential in buildings due to the size of the building stock;
- Use of pooling and other innovative (while simple) solutions.

The following graph shows the key features of the German market:



Germany in a snap-shot:

Number of ESCOs	500-550 ESCOs, of which 10 deal with EPC only
ESCO market size and potential	<i>market size:</i> €3.5-5.0 billion/a (mainly ESC) <i>market potential:</i> . €20-30 billion/year, referring to the total revenue from energy services, including energy costs
ESCO market trend	slightly increasing and restructuring with more large ESC suppliers and more utilities being involved
ESCO association	yes, numerous
Typical ESCO projects	all sectors, but most broadly targeted is the public sector heating and hot water supply, renewables, CHP are most common public lighting, control and automation and pumps are also frequent industrial processes, industrial cooling, motors, inverters, indoor lighting, air conditioning and ventilation, building shell and whole building refurbishments are least common
Main type of contract	80-85% ESC, 8-10% EPC (mainly shared savings model) new contract type emerging: IEC

Greek ESCO market 2013

ESCOs in Greece have not yet been able to establish a stable market, which is still in an initial phase. Until 2005, legislative barriers, such as procurement complexities, tender evaluation, project monitoring, repayment and the lack of a national definition of ESCO, EPC and TPF meant the main hurdles for the sector (Marino et al. 2010). From 2007 legislative changes were positive and expectations were high for a quick market growth (EC JRC 2012), nevertheless an upheaval of the market remains to be seen, and is delayed partially due to the financial crisis that has significantly affected the Greek economy and results in market uncertainty. In recent years, the number of projects seems to slowly increase, but it is far from a market boom or stabilization (EC JRC 2012).

Current ESCO market

The Greek ESCO market is very small. The market is still limited to a few EPC projects, often in the form of pilot projects financed and/or initiated through international projects. The number of initiated projects may vary between 70-100, however few of them are under implementation. In 2008, there were 2 ESCOs, and experts calculate with 2-3 more today (EC JRC 2012). Indeed, there are many engineering consulting companies (200-250) interested in engaging in the ESCO market, but only a handful of them would have the capacity and the knowledge to succeed (EC JRC 2012). Douvara, Zervakakhs, and Alexopoulos (2013) found that over 80% of local experts believe that these companies will slowly and successfully convert into ESCOs within 5, maybe 10 years. Facility managers also offer energy services. The two energy utilities or suppliers, on the other hand, are not involved in ESCO projects.

The current volume of the ESCO market is practically zero given the low activity. The market potential is estimated to be around €5 million if the market starts to open up (EC JRC 2012). Two-thirds of the local experts believe that the ESCO market's turnover will not exceed 5 billion euro during the next 20 years (Douvara, Zervakakhs, and Alexopoulos 2013).

There is no ESCO association in Greece.

Types of projects

The market has not yet extended beyond pilot projects, which have focused on primary and secondary schools, local administrations (municipalities, provinces, regions), health-care facilities, and hotels. The industry has implemented a few projects, too, whereas the production process was targeted. The residential sector is not yet interesting for ESCOs. Experts expect that the public sector will remain the main client, and the residential sector will not be in the focus of ESCOs even in the next 20 years.

Projects cover small scale CHP, waste heat recovery and solar thermal systems in the industrial sector. The tertiary sector (in particular hotels and sports centers), including public buildings implement RES solutions combined with building energy efficiency (building shell and equipment). These projects are referred to as integrated energy efficiency services⁷¹, and are most popular amongst potential customers (Konstantinou et al. 2010; Renner 2012).

Though projects are rare, EPC with a financial guarantee is the most preferred type of contract model, where the client takes only the credit risk (EC JRC 2012). Almost 60% of the local experts believe that the guaranteed savings model is the most appropriate for Greece, and around 25% think that the shared savings model is the best. The Build-Own-Operate-Transfer (BOOT) was chosen as the third preferable contract scheme. A BOOT contract means that an ESCO designs, finances, implements, owns and operates the equipment for an arranged period of time and then transfers it to the client (Douvara, Zervakakhs, and Alexopoulos 2013).

Regulatory factors

A number of favourable legislative changes (such as a new law on Public-Private-Partnerships) were implemented during the 2007-2010 period (Marino et al. 2010). This environment was further improved through the introduction of the 3855/2010 law, which sets, among others, the policies, regulations and measures for the development of the Energy Service Market in Greece (CRES 2011). This law is very detailed, describes the context and principles of an EPC, provides a model contract and prescribes the allocation of obligations and responsibilities between the ESCO and the client.

The legal basis is not completed, unfortunately, by a smooth implementation. Bureaucracy and ambiguities in the laws, as well as the lack of a completed liberalization of the energy market cause problems for ESCOs (Douvara, Zervakakhs, and Alexopoulos 2013).

Comprehensive refurbishment of a hotel



Alteren Energy and Environment S.A. implemented a bundle of energy efficiency improvement measures with a focus on the heating, cooling and the lighting systems. The package was based on a heat and cold delivery service.

Total investment volume: €53,000

Expected energy savings: €12,000/year (baseline 2010)

Contract duration: 2 years

Financial scheme: customer's funds, added to the subsidy from the NSRF 2007-2013 programme for development.

Source: Renner (2012)

⁷¹ Referred to as IEC, integrated energy contracting, in Germany. See the German chapter in this report.

Market factors

There is a continuous push towards energy services in recent years, due to the increasing public awareness of the benefits of energy efficiency and renewable energy and as a result of the rising conventional fuel and electricity prices and the economic recession (EC JRC 2012).

On the other hand, the financial crisis and the resulting economic collapse in Greece have impacted on the ESCO market and its previously foreseen development. The almost zero liquidity and market uncertainty has wrecked the ESCO development (EC JRC 2012), in spite of the local efforts.

Given the few stakeholders, competition is not yet present on the market, though the promotional activities of the government aim at boosting this, too, through challenging offers given for the public buildings.

Awareness and trust

A program named “Building the Future” was started in 2011, with a sub-program aimed at implementing pilot ESCO projects in public buildings. The core factors of the program include a wide-scale promotion of the results, the establishment of an ESCO catalogue, and the standardisation of the operational framework of the ESCO market (CRES 2011).

Financing ESCO projects

The projects in Greece are financed through ESCO and manufacturer/wholesaler financing, or from customer financing, and more and more commonly through Third Party Financing (TPF) by banks for large projects. TPF is particularly supported by the new legislative changes, too. Experts interviewed by Douvara, Zervakakhs, and Alexopoulos (2013) largely believe that TPF is most suitable for the Greek market. Only 37% of the experts suggest that customer financing would be workable, and 12% trust that ESCOs’ internal funds would be the most suitable source of ESCO projects.

In spite of the supportive legislation for TPF combined with promotion of “green products” and “green loans” by banks, the market experiences reluctance on the part of clients and investors to get involved in energy efficiency financing using bank loans (Douvara, Zervakakhs, and Alexopoulos 2013).

In 2009, the Ministry of Development initiated the program “EXOIKONOMO”. The programme was to finance 70% of the required capital in case of energy efficiency investments at municipalities combined with awareness raising activities. However, it was challenging for the potential clients to afford even the 30% of the costs (Douvara, Zervakakhs, and Alexopoulos 2013). Therefore, the Ministry of Environment, Energy and Climate Change (now in charge of the program) announced additional measures, including an extension of the beneficiaries (for people whose annual personal income doesn’t exceed €12,000 or their family income is not higher than €20,000), increasing the maximum length of the loan from 4 years to 5-6 years, and increasing the advance payment from 30% to 40% of the total budget of the project. It is not yet identified if and what kind of effect it will have on ESCOs (EC JRC 2012).

Barriers

The list of barriers in 2010 has changed by today because of the active promotion and support on a legal level. Problems with procurement rules have been dealt with, energy services are incorporated in a dedicated law (see above). However, the results of removing the legal barriers and the active

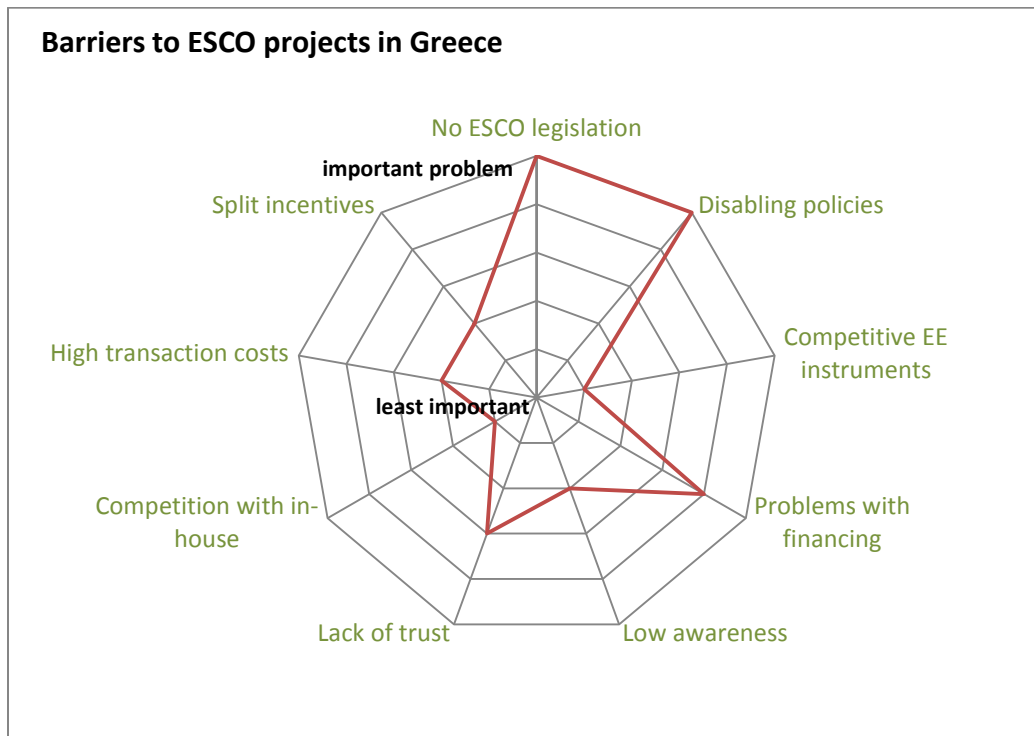
information dissemination and demonstration are not yet seen and cannot be evaluated, because the financial barrier has clogged the market.

Today, the most significant barrier is the low or even zero market liquidity. Neither the clients, nor the contractors or even the banks have the financial capacity to get engaged in long-term contracts or relatively large scale investments because of the financial crises and because of budget cuts. Technical and financial risks are perceived high and banks are reluctant to finance projects due to their smaller size. There is an overall lack of motivation on the side of the client because of the market uncertainty. Finally, measurement and verification protocols are not yet developed, decreasing the trust in the formula.

Interestingly, the experts interviewed considered the legal framework as largely unsatisfactory in spite of the notable positive changes and the dedicated energy services law 3855/2010. This is probably the result of the ambiguities and the problems with secondary legislation and practical implementation referred to by experts interviewed in the work of Douvara, Zervakakhs, and Alexopoulos (2013).

Another barrier that inhibits the ESCO market's further growth in this period is closely related to the energy consumption patterns throughout the crisis. The decreasing energy consumption in all related fuels (electricity, natural gas, diesel oil) from 2009 till now is not attributed to the implementation of energy saving measures, but rather to the reduction of the level of comfort or activity due to the economic crisis (EC JRC 2012).

In summary, the following graph illustrates the relative importance of barriers in Greece:



Conclusions and future expectations

The Greek market has been long expected to get off the ground and this expectation is growing again. Much has been done recently to improve the legislative and institutional framework. In addition, the

viability and activity of the ESCOs and interested consultants have also moved the market ahead. Furthermore, growing interest in renewable technologies, the EU's requirements for reduced emissions and implementation of energy efficiency measures as well as the increasing prices constitute opportunities for the Greek ESCO market.

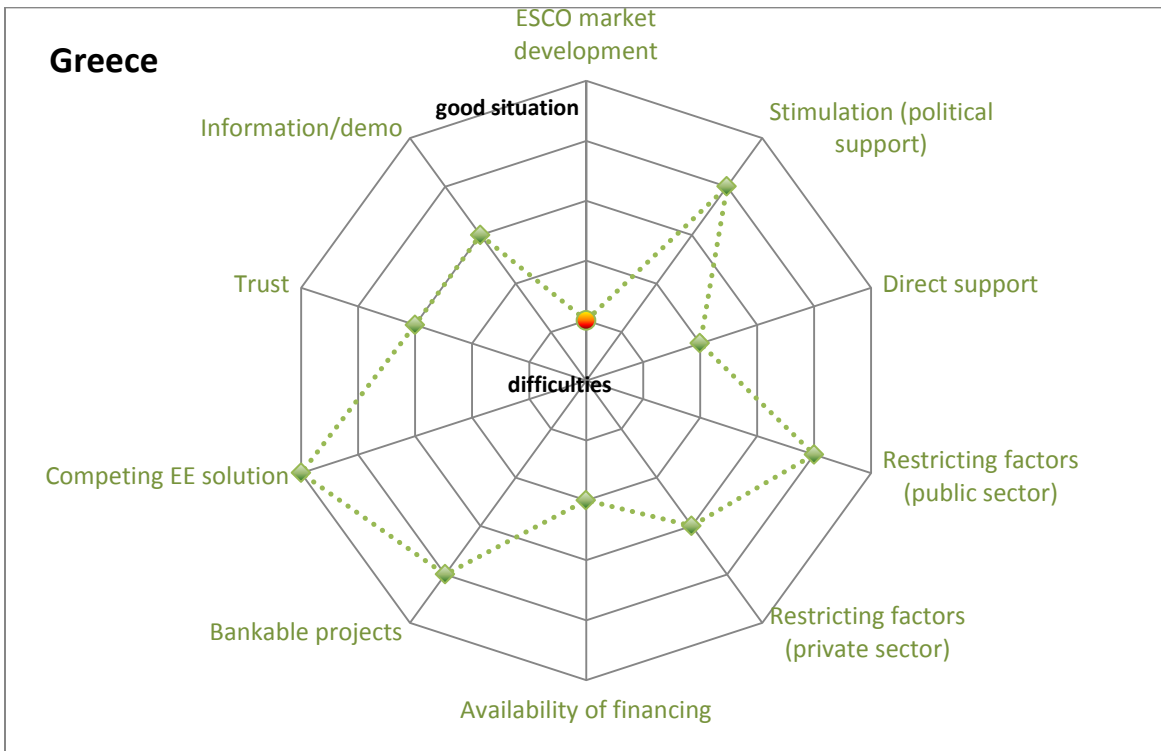
In the absence of these, not even a small market movement would have been seen probably. The financial crisis has had a destructive impact on the liquidity of the market, and even though there is interest in energy performance improvement in almost all sectors, the financial capacity is missing, combined with a fear of long-term commitments in the current environment.

If the economy starts to stabilize, it is expected that the benefits of the invested efforts will be possible to reap.

Key drivers and expected catalysts in the near future

- The legislative changes, in particular the 3855/2010 law on energy services and TPF, a law on PPP, and the 3661/2008 law on energy efficiency;
- Demonstration projects;
- Active promotion by the ESCOs and interest for the energy services market on the part of local companies.

The following graph shows the key features of the Greek market:



Greece in a snap-shot:

Number of ESCOs	2, or maximum 5
ESCO market size and potential	market size: zero market potential: €5 million
ESCO market trend	largely unchanged
ESCO association	none
Typical ESCO projects	main targets are the tertiary buildings, some projects in industry RES in industry and integrated projects in buildings
Main type of contract	EPC with TPF

Hungarian ESCO market 2013

A “unique Central Eastern European success story” – was the way to describe the Hungarian ESCO market for a long time (see for example Bertoldi, Boza-Kiss, and Rezessy 2007; Bertoldi and Rezessy 2005 and many others). The emergence of the market dates back to the early 1990s as a result of a number of coinciding success factors, such as high energy waste as a legacy of the previous system, growing energy prices, highly educated and practiced engineers looking for new business opportunities, international support programmes (in the format of training, financial incentives, credit lines), early liberalization and openness to outsourcing, etc.

As of 2010, however, it was clear that the Hungarian ESCO market had major problems. The market was fluctuating, after the cream-skimming of easy projects. Companies were either able to reorientate or went out of business, others were engulfed by more successful competitors. The financial crisis also had a negative impact on the market due to the increased pressure to save on costs (including budgetary limitation on investments), the sharp decline of the construction rate and the fear of bank loans combined with municipal budgetary limits and liquidity problems (Marino et al. 2010).

EPC solutions for multiapartment buildings: Raab-Sol project in Győr, Western Hungary



The Raab-Sol project included the renovation of a residential district, involving the refurbishment of the building shell, automation, new boilers and the revitalization of the supply network, as well as the installation of solar panels. The project also included the installation of a modern monitoring and control system.

The project was co-financed from the national grant programme (Panel Programme), combined with third party financing, where the loan was provided to the clients, and included in the raise of the common costs. An EIB-supported guarantee fund was a major benefit for the project (decrease of risk and increase of credibility of the ESCO) and used as an insurance or buffer. The project has involved a complex renovation, and resulted around 40-50% savings, as opposed to the 30% energy savings guaranteed by the ESCO. The surplus savings are shared between the ESCO and the client.

Source: Grosser Lagos (2013)

Current ESCO market

The market size of the Hungarian ESCO market as of 2013 is unknown, and was not estimated since 2007, when the interviewed ESCOs estimated it to be around €150-200 million, excluding large power plant investments (Bertoldi, Boza-Kiss, and Rezessy 2007). From the kick-off till around 2010, the number of the ESCOs was constant at around 30, of which 5-6 companies were responsible for 80% of the market. Between 2006-2010, the market was fluctuating, and many companies disappeared or were taken over by large international corporations, nevertheless new entrants were also able to emerge. As of 2013, however, not more than 10 ESCO companies exist actively. There are only few projects with guaranteed energy savings (EC JRC 2012). The financial crisis and the collapse of the construction sector had a two-faceted effect: some ESCOs disappeared because of lack of business or decline of profits (or for other reasons), while other firms that had been active in construction or consultancy before entered the market and succeeded with providing new products in the form of ESCO projects. These trends carry on in 2013, and there are many companies (and financial institutions) that see the ESCO offers as a possible way to amplify their businesses.

There are no ESCO associations, and while there was a bottom-up initiative around 2007 to establish a representative body, called the DEEM working group (EC JRC 2012), this has not survived the ESCO market decline.

Types of projects

Until 2010, the municipal sector was considered as the best target of ESCOs, because of the available grants, the trustfulness, reliability and long-standing of these clients. Furthermore the unescapable general refurbishment of public buildings, which could be then combined with an energy performance improvement were attractive (Marino et al. 2010). In the meanwhile, municipalities started to have serious liquidity problems, many of them facing bankruptcy due to erroneous decisions and a financial crisis generated loan-problem. Many municipalities had EURO or CHF-based loans (similarly to a large segment of the residential sector), and their related costs have increased dramatically due to the changes in the exchange rate, while the value of the buildings or other properties dropped as a result of the construction sector problems, causing a large negative gap between the actual value of the property and the value of the loan. Therefore, most of the municipalities have not been able to engage in ESCO (or other) projects lately. From 2010, the state has taken over the management of many municipal buildings and carried out a loan consolidation (involving banks in the resolution of the liquidity problems). These support actions may contribute to a future increase in interest for ESCOs. On the other hand, municipalities that had carried out energy saving measures in their buildings, are losing profits because the benefits are reaped by the new owner (the state) (EC JRC 2012).

Many other factors have also contributed to the decrease in municipal interest towards renovation and thus ESCO projects (see them below: unexpected policy changes and no predictability, municipal buildings taken over by the state, ESCO project failures and thus a loss of trust, lack of appropriate financial solutions, etc.) (EC JRC 2012).

Other sectors were also known for ESCOs, such as industry and supply side projects (e.g. CHP installations), tertiary sector (hotels, offices), and the residential sector. The residential sector was largely based on the strong incentive structures from Structural Funds (see more about the Panel Programmes in Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). However these incentives have ceased or drastically decreased. Because expecting these grants to reappear, building/apartment owners in the large residential districts postpone their investment decisions. However, it has been

reported that there starts to be an interest in purely market based EPC solutions by these buildings/districts as the grants are more and more delayed (EC JRC 2012).

The most widespread contract type is still Chauffage-type, but EPC with guaranteed savings model and the shared savings model also work well. BOOT contracts are also known, as well as facility management contracts.

Regulatory factors

The regulatory framework of energy efficiency and especially of the ESCO market is weak. The first and second National Energy Efficiency Action Plan both indicated a significant role for the ESCO market (Marino et al. 2010)⁷², nevertheless so far no implementing or secondary legislation has been put forward in this respect. According to the NEEAPs, targeted ESCO grants (some of which non-refundable) would be made available. There have been plans to establish a revolving fund, too, and/or a guarantee fund, which could be used as a support mechanisms to market-based involvement of bank-portfolios in ESCO projects (Ministry of National Development 2011; EC JRC 2012)

Other supportive legislative means could be involved with the transposition of the recast EPBD (2010/31/EU), which has not taken form yet, but it is expected to be made public at the end of 2013. The implementation of the Energy Efficiency Obligation may also bring benefits to the ESCOs, but the details of this are also unknown. There were plans that the obligated parties must employ third parties to carry out the energy saving measures.

Furthermore, the government has been planning and designing the establishment of a public ESCO (Ministry of National Development 2011; Bencsik 2013), however details are not available and it is not clear how such a new company will affect the market. According to the calculations, about a third of the mandatory renovation rate of 3% of governmental buildings would be done by the ESCO (Bencsik 2013).

Market factors

While the lack of regulatory environment, and the increased importance of major barriers, and new obstacles (see below) have had drastic effects on the Hungarian market, it has become clear that ESCOs are able to provide purely market-based solutions, even in special sectors, such as the residential sector (EC JRC 2012).

Financing ESCO projects

There are various modes of financing ESCO projects in Hungary, and depends on an agreement between the ESCO and the client, as well as on the liquidity of each of them. The large ESCOs are able to provide the financing from their own equity, and recover the investments during the project. Third-party financing is common.

The use of national and municipal incentives was typical of ESCO projects until 2010, however these have largely disappeared.

⁷² The first NEEAP of Hungary places ESCO amongst the priority axis for increasing energy efficiency of the Environmental and Energy Operative Programme (KEOP), as part of the New Hungary Development Plan (2007-2015) (Ministry of Economy and Transport 2008). Close to 50% of the tertiary sector savings targets for 2016 was planned to be achieved through ESCO and/or third-party financing projects in NEEAP 1 (Marino et al. 2010).

Liquidity issues represent the largest problem in financing combined with an enlarged fear of bank loans. Clients perceive long-term contracts that involve bank loans especially dangerous after the crisis with EURO and CHF-based credit lines. Although the regulations on taking loans have become much more stringent, decision-makers prefer to wait until they can find solutions without involving bank loans. In parallel banks have also developed more complicated and demanding documentation and collateral requirements, therefore it has become more difficult to put through a project where a bank is involved. At the same time, about 5 banks have special products for ESCO projects, and the state-supported special home saving arrangement, Lakáskassa⁷³, have been occasionally used as a source of financing.

EBRD and EIB have running credit lines to support preferential loans for ESCO projects, which are provided with the mediation of commercial banks (EC JRC 2012).

Barriers

While the long-standing barriers remained, new and more overwhelming ones have had a negative impact on the development of the ESCO market in Hungary.

Policy making in Hungary has not been supportive of the ESCO market in the period 2010-2013 according to the experts interviewed for the current report. Policies are made without (proper) public or expert consultation and in a hurry. Furthermore, several new policies have been counterproductive, and delineating the energy sector layers', the banks' and even the clients' attention from energy efficiency. Special taxes have been put on banks and energy firms, which in turn have reformulated their Hungarian presence and portfolios. Some banks and some energy supply companies have been deprivatized.

The utility prices have been controlled (i.e. reduced) by the state by 25% for the residential sector from 2012, which has questioned the profitability some of the exemplary residential ESCO projects. On the other hand, the decrease has been cross-financed by other sector, which means a growing energy price there.

Municipal buildings and certain services have been taken over by the state in order to help them out from difficult financial situations. However this also means a loss of profit for municipalities that were leaders in renovating their properties, thus having made an investment while the benefits are now enjoyed by the state.

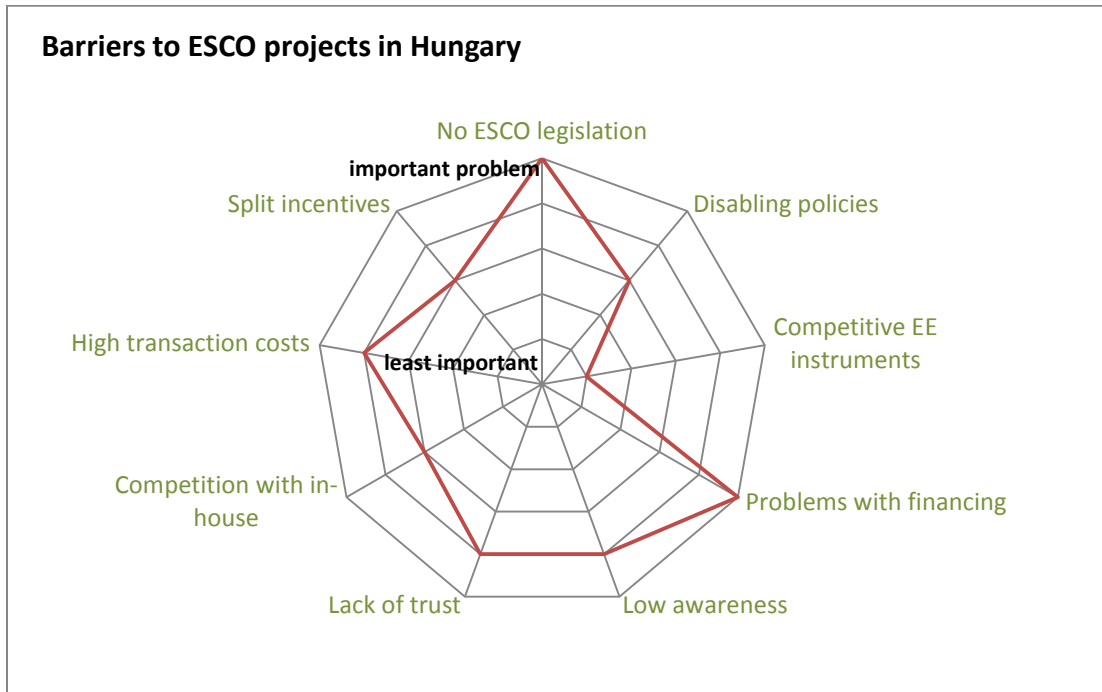
The length of the contracts and payback times has increased in the last years. They were in average 5-7 years before (Marino et al. 2010), and grew to around 10 years by 2013. This reduces interest and a more developed trust is needed by both partners. Baseline data are rare, and monitoring activities are always done by the ESCO on a professional level, using international standards. These contribute to an increased scale of transaction costs.

As described above, financing is a major problem, still, combined with lack of trust and a low level of knowledge of the ESCO concept. The ESCO is seen (both legally and in the eyes of the clients) as a new form of bank loan. On the other hand, the requirements from the banks are almost too difficult to

⁷³ A special home savings arrangement, managed by a few banks or subsidiaries of larger banks, whose function is to save money for a few years (4-8 years), when each year the state adds 30% of the savings (with a cap), and at the end of the contract, the client can receive the collected amount plus double it with a credit of the same amount. The money can be used only for purchase or renovation of a building/apartment, etc.

satisfy, municipalities face liquidity and decision-making problems, as well as there is a general resistance too bank loans.

In summary, the following graph illustrates the relative importance of barriers in Hungary:



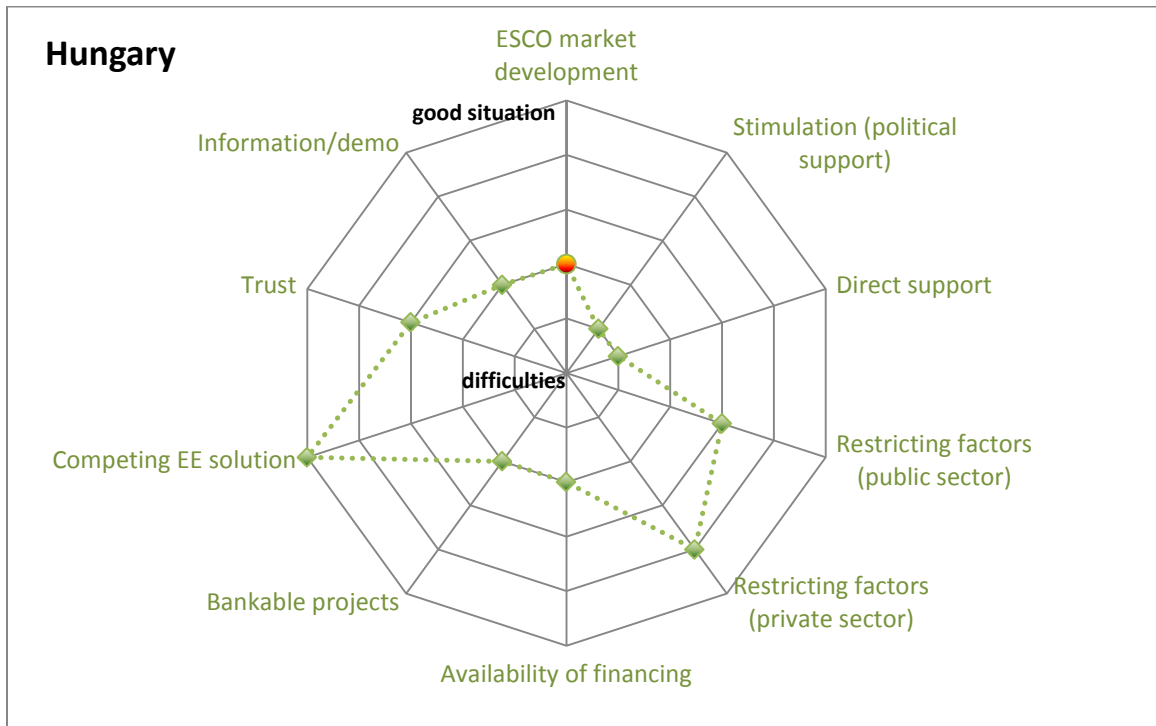
Conclusions and future expectations

The Hungarian ESCO market has a remarkable history. While it was quoted as the exemplary model of ESCO market development in Central Eastern Europe, it was fluctuating and experienced a lack of stability between 2006-2010, while from 2010 it has seen a continuous decrease. It is hoped that the regulations to be introduced as a result of the transposition of the EPBD and EED, and the relief of the municipal liquidity due to the take-over of loans by the state will be able to push the market in a positive growth direction.

Key drivers that are expected to turn the changes around:

- NEEAPs indicate political commitment to the inspiration of the ESCO market;
- The introduction of an EEO scheme and the transposition of the EPBD;
- State ESCO and the 3% mandatory renovation rate of governmental buildings;
- Revival of state grants for residential renovation;
- Continued presence of international funds (e.g. EIB and EBRD);
- Market based development.

The following graph shows the key features of the Hungarian market:



Hungary in a snap-shot:

Number of ESCOs	6-10
ESCO market size and potential	market size: unknown
ESCO market trend	drastic decrease
ESCO association	none
Typical ESCO projects	industrial sector, public buildings, hotels, residential bloc-houses
Main type of contract	Chauffage, Facility management contracts, BOOT EPC (both shared savings and guaranteed savings)

Irish ESCO market 2013

The chapter was co-authored by Cian O'Riordan.

According to previous studies (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010) the ESCO market was not well-established yet in Ireland as of 2010, and the ESCO business was embodied by 13-15 small local energy service supplier companies. Most of the focus was on supply side measures (co-generation and other boiler installations or refurbishments). This is changing at the moment and the industry is in a growth phase (EC JRC 2012).

Current ESCO market

The ESCO sector is in a phase of rapid development at present, largely due to strong support from the government and associated initiatives (EC JRC 2012) discussed further below.

On the demand side, there are public and private sector organisations. The public sector organisations have a target to achieve a 33% energy efficiency improvement by 2020, but significant capital constraints and limited human resources to deliver energy projects. Many also have facilities in need of renewal. These organisations perceive EPCs as a means of addressing these challenges. The private sector naturally has a commercial perspective, sees energy efficiency as an investment, realises capital will be provided either by the ESCO or a 3rd party, and is confident implementing these projects because that the energy performance risk can be transferred to the ESCO.

On the supply side, there are a small number of large ESCOs that are pursuing large scale projects and particularly interested in Exemplar projects. Most of the larger ESCOs that provide full EPC solutions are large multinationals. There are some subsidiaries of large companies, doing ESCO projects as a side-business, that were particularly established to take advantage of the currently available grant programs. There are also a good number of small and medium energy supply companies, typically providing biomass heat supply contracts and co-generation contracts. Finally, there is a small number of smaller ESCOs emerging that are looking for opportunities of a suitable scale in the nascent ESCO market. New entrants are often traditional service organisations and manufacturers exploring the ESCO model in order to attract new clients and occupy new business segments.

The latest figure about the size of the market is available from 2005 (€100 million), nevertheless it is expected that a study will reveal the current data in the near future (EC JRC 2012).

There is no ESCO association in Ireland; however the Sustainable Energy Authority of Ireland (SEAI) often acts as one, representing ESCOs interests and developing promotional material and support structures for the ESCO market⁷⁴. They have also established the National ESCO Action Group (EC JRC 2012).

Types of projects

Contracts are generally done in the format of the UK-style Contract Energy Management (CEM) or BOOT contracts. The SEAI promotes three major types of contracts: EPC, Energy Performance Related Payments (EPRP)⁷⁵. and Local Energy Supply Contracts (LESC)⁷⁶.

The combination of EPC and SEAI support grant



The Royal Victoria Eye and Ear Hospital engaged in a shared savings EPC model, whereas after an audit and feasibility study the hospital equipment, a CHP plant, the building management system, lighting, insulation and a remote energy monitoring system was upgraded. The project was partially financed by the ESCO and partially by the hospital from a grant assistance from SEAI
Total investment: €300,000
Guaranteed energy savings: €60,000/year
Contract duration: 10 years
Source: SEAI (2013)

⁷⁴ See e.g. http://www.seai.ie/Your_Business/National_Energy_Services_Framework/.

The most commonly targeted measures are related to heating, ventilation and cooling retrofit of buildings, lighting retrofit (mostly LED). Important sectors are health services, prisons, educational, municipal buildings on the public side, and food industry, particularly meat processing, hotels, water treatment on the private side. Furthermore street lighting projects are common.

Regulatory factors

The National Energy Efficiency Action Plans (NEEAP) of Ireland place an emphasis on the utilization of the ESCO business. The NEEAPs state that due to the financial constraints the opportunity of cost savings without upfront costs under an EPC and engaging third party financing should be considered (Government of Ireland 2011). The government has put forward the production of an ESCO Action Plan.

The Department of Communications, Energy and Natural Resources (DCENR) has developed a National Energy Services Framework to help develop the energy-efficiency market in the non-domestic sector throughout Ireland. Following the commitment in the National Energy Efficiency Action Plan (NEEAP) and the Programme for Government 2011–2016, this National Energy Services Framework sets out the roadmap through which energy-efficiency projects and an Energy Performance Contracting process will be developed⁷⁷.



Figure 5. Overview of energy services market in Ireland and the National Energy Services Framework

The following developments have emerged as a result of the National Energy Services Framework:

- The development of best practice documentation, particularly standard forms of contract, handbooks to facilitate client organisations implement EPCs, EPRPs and LESCOs, and case studies;
- The provision of extensive support for organisations wishing to adopt performance contracts, including financial assistance to get expert support when developing a performance contract (Technical Assistance), and a series of workshops to facilitate 20 Exemplars through the process.
- The establishment of a National Energy Efficiency Fund, and other developments in the banking sector, discussed in 'Financing' below.

⁷⁵ whereby the service provider/ supplier/ installer provides a guarantee that not only will the service, product or works actually fulfil the function for which it was intended, but it will do so in a way that will improve energy performance. It ensures not only the agreed functionality, but also a measurable improvement in energy efficiency will be achieved. A portion of the overall payment for the service, product, or works is contingent on demonstrated performance.

⁷⁶ dealing with supply-side measures such as co-generation or biomass heating projects.

⁷⁷ See more at: http://www.seai.ie/Your_Business/National_Energy_Services_Framework/.

- An environment that encourages public sector organisations to implement performance contracts and removes policy issues that inadvertently hinder them.
- Other market development activities to support the supply side, i.e. encourage international ESCOs to join the market and the emergence of domestic ESCOs.

A supplier obligations scheme has been planned to roll-out, which at the moment runs in a voluntary format (Maguire 2013), which will be a key element to establish a place for ESCOs through aggressive energy savings targets in the residential sector in Ireland (Government of Ireland 2011).

Under S.I. 542 and the National Action Plan on Green Public Procurement public bodies are encouraged to avail of energy performance contracting (EPC), including energy services companies (ESCOs), where appropriate⁷⁸.

Awareness and trust

SEAI has taken a very active role in developing and supporting the ESCO market in Ireland, with momentum building in 2012 and 2013. In addition to promotional workshops, there is a dedicated section on the SEAI website where relevant documentation – policy, case studies, handbooks, standard forms of contract – is available (EC JRC 2012). SEAI has collected a series of case studies and disseminates their experiences. These projects were undertaken in the public and the private tertiary sectors and covered the following technologies: lighting, heating and insulation, water saving measures, equipment modernisation.

As market participants are primarily referring to this documentation, a common understanding of the concepts and terminology is now emerging overcoming related barriers as identified at “EPC” workshops in 2011 (EC JRC 2012). A “Renewable Energy Installer Academy”, which is a training of installers has been set up. There are further advice and training activities, which are however, considered as competitive to the ESCO offers to some extent (Boonekamp and Vethman 2010).

It is expected that ESCO market supply side measures will be stepped up in 2014.

The Exemplars, referred to above, will become demonstration projects in 2014 from which the market is expected to get further push to evolve.

Financing ESCO projects

Financing of ESCO projects is not one of the key barriers in Ireland. Indeed there is a selection of financial programmes that could support – among others – the ESCO structures, too. A 4-year grant programme has promoted the uptake of energy efficiency projects. In particular, the 2011 and the 2012 grant objectives and scoring criteria rewarded ESCO/EPC or energy performance related payment type arrangements (EC JRC 2012). Whilst government grant schemes have been effective in leveraging private sector investment in energy efficiency projects, these have not supported the development of the ESCO market (and, arguably, have been a hindrance as client/host organisations have not needed to explore alternative financing mechanisms). Furthermore, financing for EPCs was a significant barrier to market development, with financing institution having little experience in lending where the cash flow

⁷⁸ See more at:

http://www.seai.ie/Your_Business/Public_Sector/Funding_Finance_Procurement/Public_Sector_Procurement_Requirements/#sthash.oWKIRmM2.dpuf.

arising from energy saving projects will provide the means of repaying the debt. This is being addressed currently.

In 2013 Ireland established a National Energy Efficiency Fund, seeded with €35million of government money, matched by a minimum of €35m from the private sector. The Fund will lend to clients and/or ESCOs for energy efficiency investment projects (and, to a lesser extent, renewable energy projects), particularly those employing Energy Performance Contracts or Energy Performance Related payments on a commercial basis. A fund manager has been appointed and lending with start in first quarter of 2014.

In December one of the larger banks launched a €100 million fund for small and medium-sized businesses to help them invest in energy-saving projects. Crucially, the bank said the loans, which are supported by the European Investment Bank, would be the first to take projected savings into account when the ability to make repayments was being calculated.

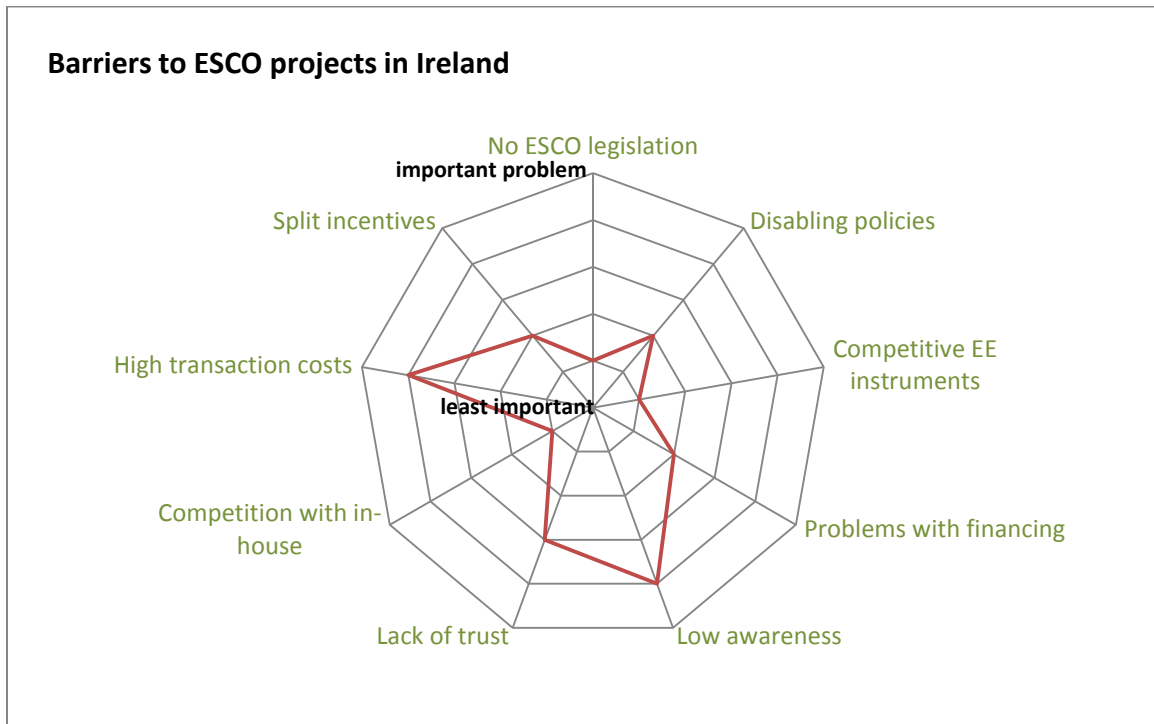
In the residential sector, state funding for the “Better Energy Homes” grant scheme will be replaced in 2014 with a “Pay As You Save” financial model, whereby energy consumers can finance their energy efficiency investments with the energy savings that they generate. It is envisaged that the work will be paid for by energy utilities (combined with the supplier obligations scheme), and homeowners will pay for the works over time through their utility bill; the value of the energy savings should approximately match the repayment period. Crucially, if the residence is sold, the cost of the works will remain with the property, transferring to the new owner’s utility bill.

There are specific grants also in the public sector for renovation of buildings, such as the “Better Energy Workplaces” (Government of Ireland 2011).

Barriers

Information about barriers is scarce and therefore it is difficult to compare them. It seems that the ESCO and EPC concept is establishing a strong root these days in Ireland based on a complex set of actions. There is a strong supportive legislation, actions have been taken against disabling policies. Financing of ESCO projects is not a major barrier, though there is room for development primarily in involving banks to larger extent. Essentially, the “pay as you save” system is able to deal with split incentives and the energy efficiency investment costs are transferred between owners when a property is sold. On the other hand, transaction costs are high, which may decrease as experience and trust increases. There are problems with the knowledge and awareness of potential clients, which should be further improved through trainings, online dissemination of information and demonstration projects. As a result, trust needs to be further developed, too.

In summary, the following graph illustrates the relative importance of barriers in Ireland:



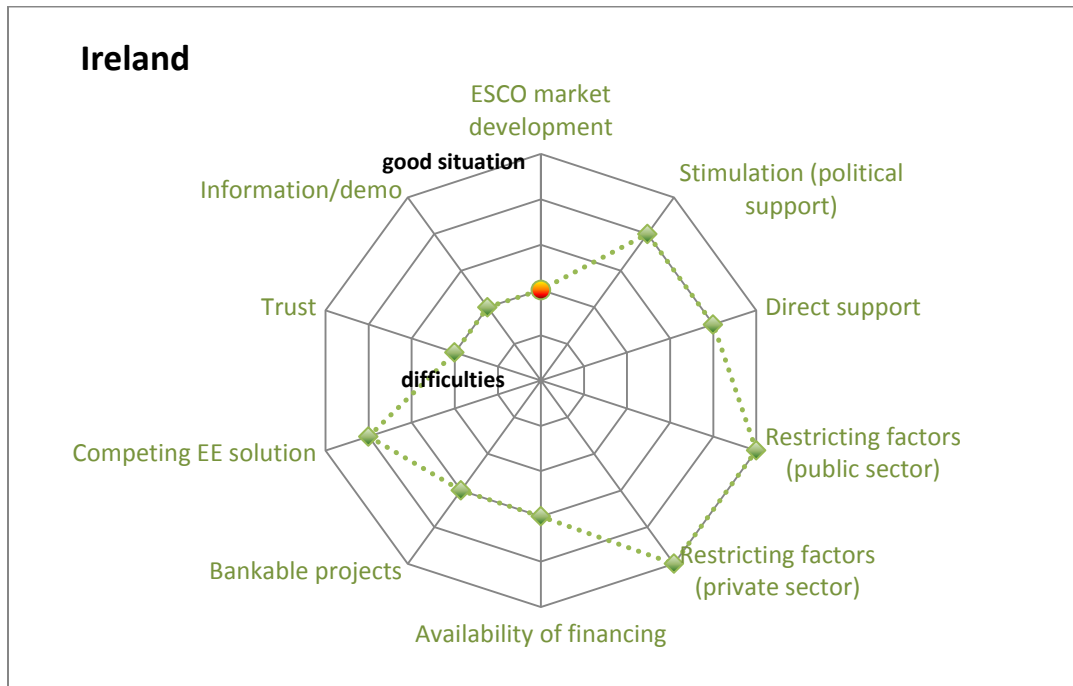
Conclusions and future expectations

There have been significant market developments over the past 12 months that have transformed the environment for the development of the ESCO market. It is expected that 2014 will see pilot Exemplar projects reaching fruition, and these will be followed by a wider range of projects.

Key drivers

- National Energy Efficiency Fund
- Template contracts and supporting documentation
- Resolution of disabling policies
- Market promotion activities
- Supplier Obligation Scheme
- Successful pilot projects, helping to build market trust

The following graph shows the key features of the Irish market:



Ireland in a snap-shot:

Number of ESCOs	large ESCOs: fewer than 5 small ESCOs: estimate fewer than 10 energy supply companies: circa 20, small and medium enterprises
ESCO market size and potential	market size is unknown market potential is unknown
ESCO market trend	strong growth
ESCO association	none
Typical ESCO projects	mostly pilot projects, mainly in the public and private tertiary sectors
Main type of contract	EPC, EPRP, LESC

Italian ESCO market 2013

The Italian energy services market is amongst the developed ones in Europe when it comes to the wide array of companies (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). However, the number of ESCO companies and the actual success of the market has been repeatedly a matter of discussion and sometimes has been overestimated because of the long-standing lack of clarity about the definition and an agreement on which companies could be considered ESCOs. In 2009, an estimate based on the information from associations implied the existence of 100-150 ESCOs (Marino et al. 2010).

Current ESCO market

The market size and the number of actual players have not changed significantly in the period 2010-2013, however entries in official registries have grown. There are around 2000-3000 companies registered as Energy Services Enterprises (SSE) at AEEG⁷⁹, the Italian Regulatory Authority for Electricity and Gas (EC JRC 2012). These SSEs have access to the White Certificate mechanism, but only a fraction of them (387) have already obtained a certificate for the projects implemented (AEEG 2013). Many of the SSEs describe themselves as ESCOs⁸⁰ (usually among other business orientations), but local experts highlight that much fewer have actually carried out an ESCO project according to the requirements of the standard UNI EN 15900 Energy Efficiency Services (EC JRC 2012).

The Italian standard UNI CEI 11352⁸¹ was created in 2010 to overcome this ambiguity about the identity of ESCOs. As of 2013, already 49 companies were certified (EC JRC 2012), and the number is constantly increasing because the number of ESCOs is estimated to be around 50-100 (EC JRC 2012).

The market is dominated by a few large ESCOs, mostly subsidiaries of large international corporations. According to Chiesa, Chiaroni, and Frattini (2011), ESCOs with less than 10 employees represented about 60% of the total number of ESCOs active on the Italian territory and generated 10% of the of the total market volume, whereas ESCOs with more than 250 employees represented just 5% of the ESCOs number and generated 50% of the total market volume in 2010. These ratios have not changed since then (EC JRC 2012).

The market volume was estimated to be around €500 million in 2011 including all energy efficiency services costs (also energy costs), for all kind of ESCO-type contracts. Estimates in 2011-2012 for the market potential put forward by the experts interviewed for this report are very diverse; ranging between €1-10 billion/year (EC JRC 2012).

There are two major ESCO Associations: AGESI (incorporating around 30 large companies) and ASSOESCO (representing 30 small and medium sized enterprises and consultants). Other related associations are FEDERESCO, which is an assembly of 50 local organizations dealing with various

Renovation of social housing by using EPC



The Fresh project (“Financing Energy Refurbishment for Social Housing”*) – an IEE supported project between 2009-2012) aimed at demonstrating that EPC can work for residential buildings, in particular for the refurbishment of social housing. Social housing is typically provided by local authorities for a subsidized rent, whereas the utility costs are paid for by the tenants. Rent may be increased as a result of refurbishment, however the interventions need 100% agreement from tenants. The possible rent increase is insignificant due to the social reasons, therefore EPC seems to be an alternative to finance investments.

The pilot project in Italy was a 13-apartment building. The selected technologies were heating and hot water systems. The envisaged energy savings are 35% of baseline energy consumption.

Source: Milin et al. (2011)

* <http://www.fresh-project.eu/> and <http://www.acer.re.it/AcerHomepage/Archivionotizie/2012/quiugno/materialeconvegnoFresh/tabid/634/Default.aspx>

⁷⁹ <http://www.autorita.energia.it>

⁸⁰ Usually around 40-50% of them indicate to be able to offer ESCO services.

⁸¹ “Gestione dell'energia - Società che forniscono servizi energetici (ESCO)” certification

activities in the field of energy efficiency interventions and AssoEGE, the associations of energy experts certified UNI CEI 11339.

Types of projects

Italian energy service providers have always privileged large project-sizes as they are more profitable, and thus ignored large potentials of energy savings existing in smaller properties such as small and medium companies, or households. The sector where most projects have been implemented is the public sector, starting from healthcare. The private sector is presently much less developed, especially in the residential case. Energy efficiency in industry is growing though it is constrained by financial issues. This demand sector consists mainly of small and medium size enterprises.

Market surveys performed in the last years (Chiesa, Chiaroni, and Frattini 2011) highlighted that the main technologies of applications addressed by ESCOs between 2005 and 2011 related to energy production and CHP (35% of ESCOs), renewables (34%), lighting (30%), climatisation (18%), energy management (15%), electric motors and inverters (14%), DH (14%), insulation measures (9%), and energy efficient refrigeration (8%).

The most widespread contract types are similar to Chauffage contracts and are referred to as "Servizio Calore" (heat service contract) and "Servizio Energia" (energy service contract) in the Italian context. These are mostly used for heating and cooling refurbishment projects and for industrial clients, but they are also common for some public buildings, in particular for in public healthcare. ESCOs typically prefer to provide packages of services combining energy supply with energy management and energy efficiency improvement actions under the above contract types, as provided for in the Decree 115/2008 (see below).

This represents a major obstacle to a wider diffusion of EPCs in Italy. EPCs are mostly used for smaller projects as a result of difficulties in financing and projects are known for cogeneration plants, heating management and efficient lighting (CombinES project n.d.). Both the guaranteed savings and the shared savings models are applied.

Facility management contracts and other contracts for global services that are combined with some level of guaranteed savings are also known. The BOOT contract is another widespread agreement type.

The number of currently running projects is in the range of few 100s. Italian ESCOs work also outside of the country and some of them have projects all around the world (EC JRC 2012).

Regulatory factors

Italy has a dedicated regulation for energy performance contracting. The Legislative Decree 115/2008 (transposing Directive 2006/32/EC) is still the most relevant legislation for ESCOs. It defines an ESCO as a service company that offers contracts, guarantees energy savings and participates in the financial risk of operations. The Decree defines energy service contract and energy service plus contracts⁸² introduced originally by Presidential Decree 412/93 (EC JRC 2012).

⁸² These contracts assure energy efficiency improvements by at least 10% in the case of new contracts and by at least 5% in the case of contracts renewed within the first year compared to a theoretical baseline. The energy efficiency improvement is not measured but calculated.

The standardization norm for ESCOs, the UNI CEI 11352 standard was introduced in 2010, and has been expected to increase trust and credibility through a more transparent identification of companies. As of October 2013 the standard is being revised to take into account market needs and the new legislative - regulatory requirements (eg. Directive 2012/27/EU) (EC JRC 2012). The minimum requirements for certified ESCOs include EPC contractual agreement and the capability to implement the energy management system at customer premises (EC JRC 2012).

Market factors

Experts evaluate the Italian ESCO market as slowly increasing, even though with a more restricted pace than before. This growth seems to be driven primarily by the natural growth of interest in energy efficiency of the market.

There is a need for increasing expertise and best practice amongst ESCOs and the small/medium-sized enterprises active on the energy efficiency market, from contractual and risk management aspects.

The economic crisis has been heavily affecting the ESCO market, especially because of the leading role played by ESCOs implementing projects in the public sector and because of the budget restrictions being increasingly applied in this sector.

Financing ESCO projects

Projects are financed from a variety of sources. ESCOs own equity is a privileged source of financing by clients, especially in the traditional Heat Service Contracts. The role of commercial banks is slowly increasing, lending to either the ESCO or the client. Nevertheless, one of the crucial barriers remains to be the availability of TPF, due to the lack of interest and energy efficiency expertise at the banks and the difficulty in arranging a profitable financial mode. It is particularly hard for new ESCO entrants to access finance and credit (EC JRC 2012).

EU funds have an increasing role in funding projects, while national incentives, and local programs are also available although these are often sporadic and are provided on a short term basis (EC JRC 2012).

Italy has established special fiscal support for energy efficiency and thus ESCO projects. There is an income tax credit of 65% for building refurbishment, and an income tax credit of 20% for new efficient engines and inverters in particular for the industrial sector (Albonico and Cayla 2013). However, there is a paradox in this relation, because energy services are placed under the resolution number 94 / E 2007 of the Revenue Agency, implying a 20% VAT, while simple equipment purchase is possible with 10% VAT (Albonico and Cayla 2013). This contradiction needs to be resolved. In addition, there is an overlap of many incentives (the tax credit for energy efficiency, the tax credit for restructuring, the energy efficiency certificates, etc.) (EC JRC 2012).

The Province of Trento and several other regions established specialized funds for energy efficiency, many available for ESCOs too, or have a separate credit line for clients and one for the ESCO⁸³. The Trento fund is based on the collaboration with local and national financial institutions⁸⁴. (EC JRC 2012).

The White Certificate scheme has proven to be a successful driver of the ESCO industry because it enables the project owners to gain extra profit through selling the achieved energy savings (Albonico

⁸³ <http://www.csqa.it/CSQA/Finanziamenti>

⁸⁴ <http://enerweb.casaccia.enea.it/enearegioni/UserFiles/OSSERVATORIO/Sito/osservatorio.htm>

and Cayla 2013). D.Lgs. 28 December 2012 defines the new targets and procedures for the White Certificate schemes and new guidelines are expected at the beginning of 2014 (EC JRC 2012).

An interesting financing mechanism designed e.g. in the Lombardia region is the so called “mutuo a profitto”⁸⁵. It is a subsidized loan for families and natural persons owning homes and condominiums and has been introduced to implement energy efficiency measures and foster the use of renewable energy sources. It consists in an interest free bank loan for which the interests are paid by local administrations and financial institutions, thus activating a co-funding mechanism by the banking system and the public administration.

It is finally worth mentioning that the creation of a national fund to be used as a loan guarantee for banks financing energy efficiency projects is another important financial instrument whose creation is solicited by many Italian experts active in the field. Such a fund could multiply the volume of projects by activating many local small ESCOs that are willing to participate in the ESCO market but are restricted by their financial capabilities. It would not directly support the projects but serve as a bank insurance behind the guarantee given. The source of the Fund could be partially a tax on the White Certificates or could be a substitute of direct financial incentives. A guarantee fund was foreseen in the aforementioned Legislative Decree 115/2008; however this clause has been abrogated in 2011 (EC JRC 2012)

Barriers

Barriers acting on the policy/regulation side (e.g. slow policy implementation, lack of attention on energy efficiency), on the energy service supply side (e.g. high risk perception, long paybacks, difficult access to capitals, lack of technological R&D activities on small projects) and on the demand side (e.g. low understanding, lack of information and skepticism on ESCO business and related contractual arrangements) are generally in place in Italy and have probably become stronger in the last two-three years.

The legislative hurdles are probably the strongest barriers, even if there seems to be a quite well-developed legislative background for ESCOs⁸⁶. Legislation changes too often, which represents a significant risk for an ESCO project. During the 1-2 years needed to prepare a contract, regulations, and in particular monetary and fiscal incentives, change and the partners find themselves coping with a different framework and scenario than the one they had considered before (EC JRC 2012).

Some legislation is confusing or contradicting with other parts. While the Legislation 115/2008 has been adopted to institute a transparent ESCO definition and create more trust based on accountability, it promotes packages of heat supply, energy management and refurbishment, which may hinder the diffusion of EPCs. The problem is that verification of the energy saving performance is difficult and consequently the guarantee for the results in terms of fuel saved usually cannot be checked (EC JRC 2012).

Financing of ESCO projects is difficult. Although regional funds are available, these are sporadic and short term. Banks are not really open for financing energy services due to a lack of interest and expertise, and generally treat it as a normal asset based loan and the EPC guarantee is not accepted as collateral.

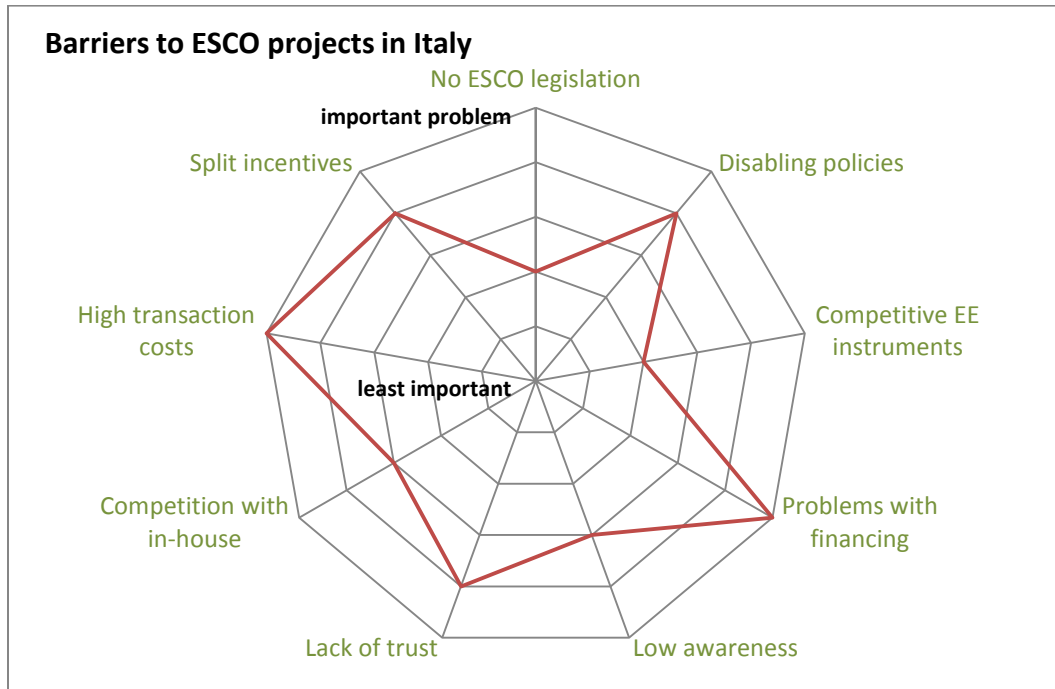
⁸⁵ “Profit Mortgage” could be a suitable translation for this expression.

⁸⁶ e.g. the 115/2008 decree is not yet applied due to the lack of secondary legislation (Albonico and Cayla 2013).

There is still a high level of lack of clarity about the definition of ESCOs, or even more the legally available definition limits the activity of many interested small companies. On the other hand, there is now a registry and official standard, many companies claim to be ESCOs (eg. in the AEEG list) whilst cannot actually offer guarantees and/or have no financial solutions to offer for energy efficiency investments.

Another key problem is related to the lack of accurate and credible monitoring. Although credible and accurate M&V activities can increase the trust between the contractor and the potential client, these activities can sometimes significantly increase investments' transaction costs (CombinES project n.d.).

In summary, the following graph illustrates the relative importance of barriers in Italy:



Conclusions and future expectations

The energy service market is a relatively large one in the European context and has been developing, although the rate of growth has moderated during 2010-2013. There is a large number of companies interested in providing ESCO services, but only a fraction of them are able to do so. Large companies with significant engineering and financial capacities dominate the market, and their activities are further supported by the prevailing legislative framework.

Despite the developed legislative background combined with certification based on an official standard, the quite strong institutional framework, wide range of credit lines, and promotional activity, the expected success of the ESCO solution falls much behind expectations in Italy. It seems that the supportive tools are not designed well to provide unbalanced support for all market players.

First of all, a stable and long-term energy policy with only infrequent changes in the secondary legislation would be one of the most important step forward. The ESCO and contract definitions would need to interpret a wider range of companies, allowing more local and small/medium sized enterprises to participate successfully in the market. The legal basis for the verification of the performance guarantees should be improved. Long lasting financing instruments should be preferred over the not

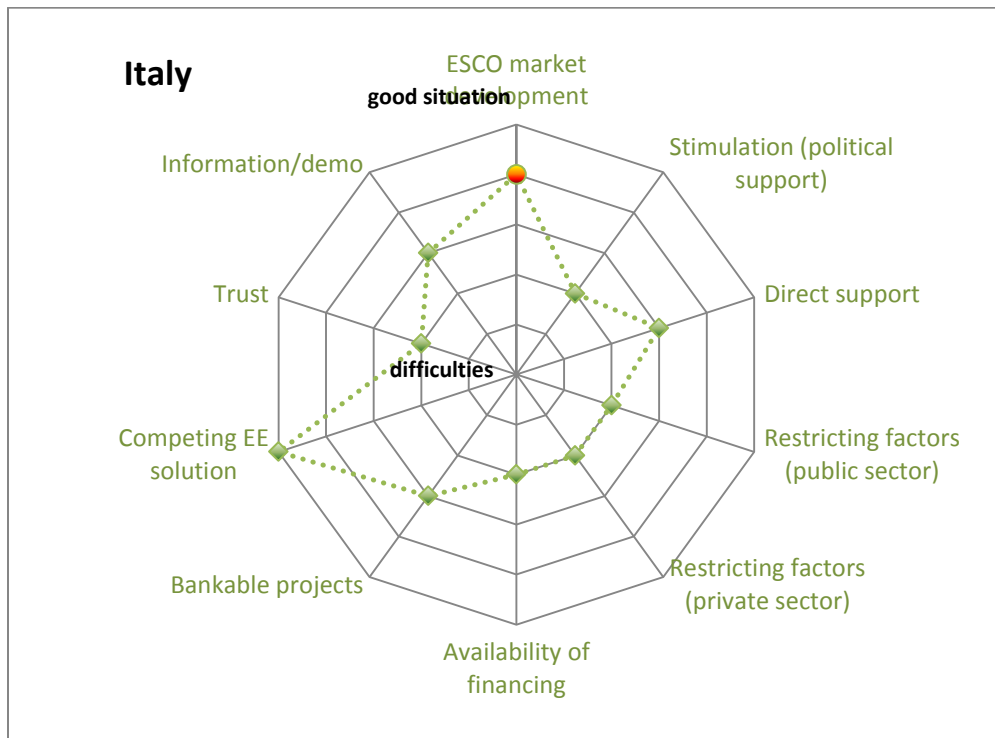
very well-balanced and short lived financial incentives (Albonico and Cayla 2013). A marked distinction can generally be drawn between projects to be implemented in the public and the private sectors concerning the approach and strategies typically adopted by ESCOs active on the Italian market. In the public sector the public-decision making process on projects implementation is typically mainly based on the analysis of the initial investment costs. Hence, competitiveness is not often determined by project characteristics related to energy efficiency but rather by experience in public tenders and investment capacity by ESCOs. In the private sector there seems to be more room for competition on energy performances of projects and small and medium sized ESCOs can be less disadvantaged compared to larger ones.

Overall, the existing legislative framework, notably the White Certification scheme and a slowly increasing interest in energy efficiency by potential ESCO clients, seem to be the main drivers of the ESCO market development in Italy (Di Santo et al. 2011).

Key drivers

- Legal framework of the ESCO market and certification based on a standard;
- Growing demand side interest;
- Credit lines and other financial and fiscal mechanisms;
- Active promotion and awareness raising.

The following graph shows the key features of the Italian market:



Italy in a snap-shot:

Number of ESCOs	50-100 (according to the Italian standard UNI CEI 11352)
ESCO market size and potential	<i>market size:</i> €500 million including all energy efficiency services costs (also energy costs), for all kind of contracts <i>market potential:</i> €1-10 billion
ESCO market trend	slow growth (the rate is slower than before 2010)
ESCO association	AGESI, ASSOESCO, FEDERESCO, AssoEGE
Typical ESCO projects	public hospitals, schools, industrial sector, offices cogeneration, heating management and efficient lighting
Main type of contract	Heat Service Contracts/chauffage ("Servizio Calore" and "Servizio Energia"), Facility management contracts, BOOT some EPC (both shared savings and guaranteed savings)

Latvian ESCO market 2013

The activity and the level of development of the ESCO market in Latvia have not changed significantly during the last few years. The market can be described as emerging, with only limited activity due to the numerous and difficult barriers mainly regarding financing and the lack of political commitment to building renovations and rhapsodic activity in this field. There are very few support factors, one of which is the establishment of the "Housing and Energy Conservation Bureau". The ESCO market has been slowly moving towards activities in the residential sector.

Current ESCO market

The first energy service projects (municipal street lighting improvements) were carried out in the early 2000s. By 2006, 2 ESCO companies operated in Latvia, which increased to 5 by 2009 (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). As of 2013, 8 companies are known to offer energy efficiency services, most of which implement ESCO projects in addition to their usual business activities (typically delivery of energy or equipment), and only few companies offer ESCO services as part of their core business. ESCO projects are not always market based, for example, one of the Latvian electricity utility companies started to be engaged in energy efficiency in order to increase customers' satisfaction and loyalty. Only a few companies provide risk management and/or saving guarantees.

ESCOs are typically small national or local companies, because the projects are too small to attract the interest of large international firms (EC JRC 2012).

The size of the ESCO investments by RENESCO only is estimated to be around €2-3 million/year (EC JRC 2012), and the total size of the total energy efficiency market is considered to be significantly larger. The technical potential of multi-family buildings is put at €5 billion (investment), at €2 billion for public buildings, and at €2 billion for commercial buildings⁸⁷ (EC JRC 2012).

An ESCO association - ESCO Latvija – was established recently, however due to the small number of ESCOs, the association is dormant (EC JRC 2012). Another organisation, the Housing and Energy Conservation Bureau, was created. The Bureau aims at promoting the use of EPC+, an ESCO contract model combined with state grants and forfeiting, to finance large scale renovations of bloc-houses that are in particularly obsolete state (Government of Latvia 2011).

Types of projects

The majority of contracts are in the form of Energy Performance Contracting (EPC), which is almost exclusively applied as guaranteed savings. There is one company in the industrial sector that uses “Energy Partnership Contracts”⁸⁸ (EC JRC 2012)

The Housing and Energy Conservation Bureau promotes its adapted EPC model, the Building Renovation and Energy Performance Contract or EPC+. The idea is that EPC+ is based on a national policy, whereas a building renovation of “panel houses”, including the technical, financial and legal solutions are combined in a 20 year commitment to ensure that energy savings finance the complete renovation of a building including non-energy-saving measures (Housing and Energy Conservation Bureau 2013). This would enable the residents, who own the apartments in obsolete and even dangerous buildings to improve their living conditions as well as financial situation.

The key recipients of EPC projects are residential multi-apartment buildings, whose participation in the ESCO market has increased in recent years. The success of EPC in the domestic sector is due to the possibility to combine ESCO solutions with the national renovation programme and its financial incentives. The programme will come to a halt in 2014, and therefore the projects will slow down. The

EPC renovation of multi-apartment buildings



The renovation of a multi-apartment building from the 1980s in Valmiera is one of 7 residential EPC projects of RENESCO. The project was completed during 2010-2012. Further 10-20 similar projects are expected during 2013-2014.

Source: <http://www.sunenergy.lv/> and EC JRC (2012)

⁸⁷ Earlier estimates and other experts refer to a significantly smaller market potential of about €100-150 million (EC JRC 2012; Marino et al. 2010).

⁸⁸ In these ESCO constructions, the ESCO sets up a special vehicle (SPV) company where the ESCO and the industrial partners become the shareholders. The SPV takes on all energy related activities of the industrial plant. The main mission of the SPV is to implement energy efficiency and use of renewable energy sources.

other major client remains the heat sector (mainly district heating)⁸⁹ (EC JRC 2012). There have been a few successful projects also in private commercial buildings and in the public sector during the last years (EC JRC 2012).

Regulatory factors

The regulatory framework of ESCOs and EPC is poor. The Ministry of Environment and Regional Development and the Ministry of Economics are currently working on a legislative framework to support EPC in the public sector.

At the moment, legislation is rather restrictive than supportive. Public budgeting rules discourage savings and there are strict debt limits for public entities. Public procurement law hinders the participation of ESCOs in tenders (Boonekamp and Vethman 2010).

Energy supply is privileged over energy efficiency. Energy supply companies lobby for large subsidies and in this situation energy savings are discouraged (EC JRC 2012). Especially district heating companies compete strongly with ESCOs both at the market level and at political level. The frightening trend of aging building stock has not been appropriately addressed yet (EC JRC 2012).

Market factors

Market based energy efficiency offers represent only a limited share of ESCO activities, and are restricted to industry and private tertiary clients. The core problem is that energy prices are rather low, because the excise tax is low (4%), and energy supply is heavily subsidized. There is a clear competition between energy supply (i.e. selling more energy) and energy efficiency services (i.e. saving energy) (EC JRC 2012). ESCOs are often mystified by competitors and the market alone cannot take up energy services, thus the ESCO projects remain to serve a niche business.

To be bankable, energy efficiency improvements need financial incentives from the public budget, especially in the residential sector. While energy is cheap, energy bills may still represent over 20% of households' income⁹⁰, which limits the ability of residential building owners and housing associations to engage in a renovation project on their own. Lately, EPC has been gaining ground because of the possibility to combine grants with the ESCO solution. While these grants may naturally compete with marketable ESCO projects, they have been seen as a support to the ESCO sector in Latvia, as far as ESCOs are not explicitly forbidden to participate. According to experts, it will be important to continue these grants in order to ensure the necessary building stock renovation, including the improvement of their energy performance, and allow for a natural competition between projects, where building owners can carry out the activities by themselves or with the help of a third party (EC JRC 2012).

Energy agencies offer energy efficiency activities such as initial audits, which may compete with or help the private ESCOs depending on their design (Boonekamp and Vethman 2010). Furthermore, there are companies that carry out energy efficiency improvements in order to increase customers' loyalty, others offer equipment, but not guarantees.

⁸⁹ During 2007-2010, co-generation and district heating, street lighting and public buildings were more common (Marino et al. 2010).

⁹⁰ Over 37% of people in Latvia are unable to keep their homes warm and face disproportionately high energy bills, and are considered as energy poor (Jurdziak 2012).

Awareness and trust

Information and examples are poorly disseminated, which results in a low awareness about the ESCO solution. Latvia has participated in a number of EU projects that have some impact on the knowledge development to some extent, but much more would be needed. At the bottom of the problem is that the local disseminators themselves are not comfortable with the concept and mystification of the ESCO solution undermines the efforts for promotion.

Financing ESCO projects

Financing is a major problem in Latvia. Loans are expensive, equity requirements from banks are high ($\pm 40\%$), and no preferential or specifically designed products are available for ESCO projects. At the moment there is only one bank that finances EPC. Supplying the equity into a project is problematic. Off-balance sheet solutions are not available.

Projects cannot be financed by the clients – as shown above. The residential clients do not have enough disposable income to participate in the costs of the renovation. On the part of the municipal sector, the length of the projects causes problems, this being longer than 4-5 years, i.e. expand over an election cycle.

Therefore projects are financed either by the ESCO, or by banks who give regular loans to the client or to the ESCO. During the peak of the financial crisis, even these regular bank loans evaporated, but in the meanwhile they have returned again. Whenever available, state grants are combined with the ESCO guarantee.

Barriers

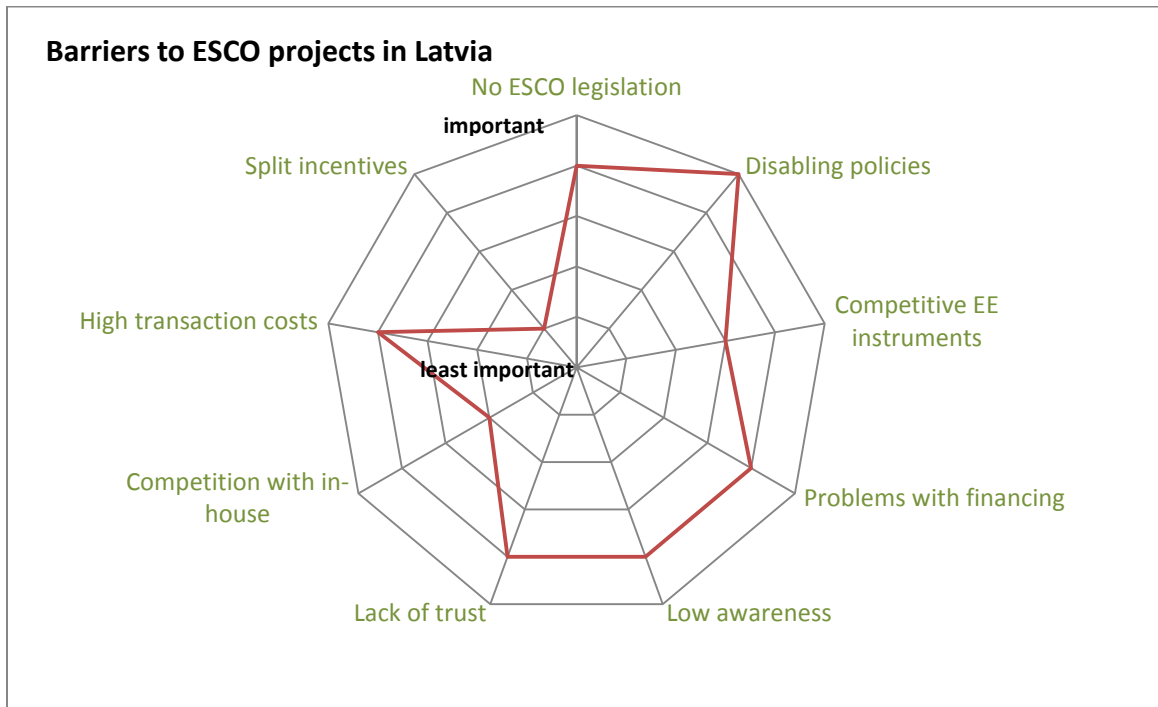
The primary barrier to the ESCO market is the lack of appropriate financing and the low credit rating of clients. Banks do get engaged in ESCO projects occasionally; however they do not have special products for energy efficiency renovations and require strong collateral. Currently there is one bank which is involved with EPC financing. Grants can be used to enable the bankability of ESCO projects; however they are somewhat rhapsodic and sometimes discourage the combination with an ESCO solution. In fact, the renovation programme comes to an end in 2014, which will largely hinder further projects. Municipal projects have too long payback times compared to the election cycles due to multiple factors, including the low energy prices, expensive loans, and strict budgetary limitations.

The bureaucratic and rigidity of grant applications and of public procurement complicate ESCO projects, at the same time increasing the costs.

Awareness of energy efficiency in general is low, and potential clients do not know about the ESCO solution. There is a strong competition from the side of energy supply. Furthermore, the following points have been highlighted by the second NEEAP (Government of Latvia 2011; EC JRC 2012):

- legal obstacles in the public sector concerning the conclusion of service contracts;
- a lack of interest by energy supply companies in providing energy services;
- the lack of enough positive examples that are widely disseminated and known;
- unclear financial matters concerning the implementation of ESCO, as well as by the absence of state guarantees for issuing ESCO loans.

In summary, the following graph illustrates the relative importance of barriers in Latvia:



In spite of these barriers, though, the market has been able to remain going, even if it is moving slowly.

Conclusions and future expectations

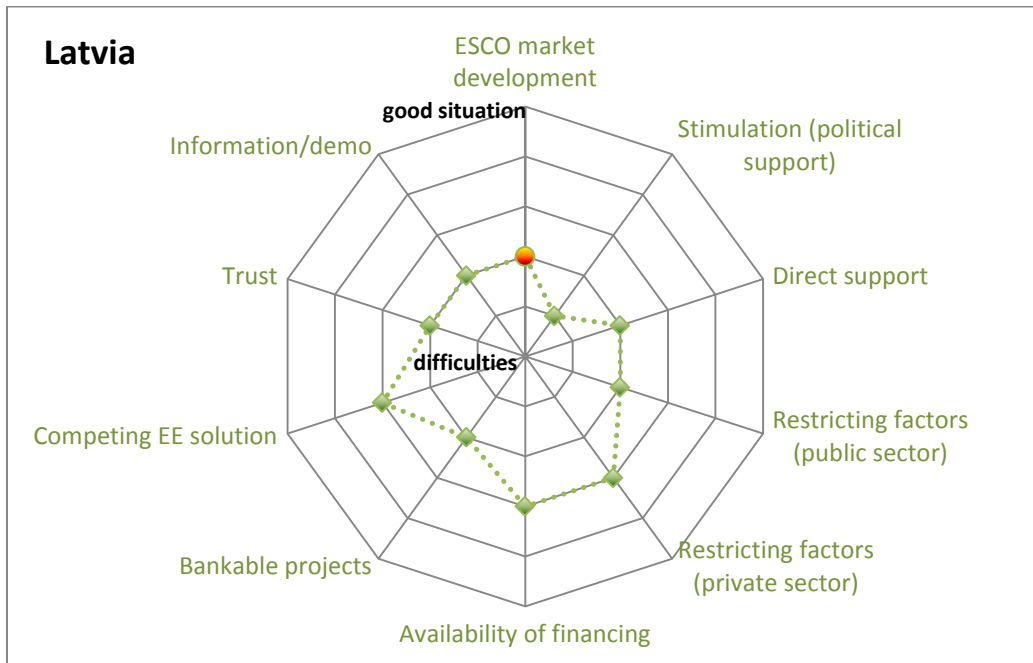
Based on the above, the Latvian ESCO market is growing, even if at a limited pace. While the financial grants are currently seen as inevitable for the success of ESCO projects, sometimes they may appear as obstacles to marketable energy efficiency projects, especially when ESCOs are explicitly excluded at the design phase.

Furthermore, EU legislation is considered as an important driver of the sector. Both of these have been indicted as desired further in the future. Besides, there are numerous barriers that have to be dealt with in the future in order to achieve an ESCO activity that is necessary for the intensive renovation needs, including the removal of regulatory problems and competition with energy supply, awareness raising and the design of financial solutions.

Key drivers

- State grants that can be combined with the ESCO structure;
- Bank involvement;
- Some positive examples;
- Aggressive lobbying to achieve institutional and informational support;
- Establishment of a promotional and representative body.

The following graph shows the key features of the Latvian market:



Latvia in a snap-shot:

Number of ESCOs	8
ESCO market size and potential	market size: €2-3 million (investment/year) market potential: €100-150 million or ca. €7 billion (depending on the source)
ESCO market trend	largely unchanged with minor transformation
ESCO association	none
Typical ESCO projects	residential buildings and heating
Main type of contract	various types, including EPC

Lithuanian ESCO market 2013

Energy services, ESCOs and EPC are rare and rather unknown in Lithuania, and the market has not been able to overpass an infancy stage yet. Not more than a few successful projects have been implemented during the last five years.

Current ESCO market

The ESCO market in Lithuania was started in the scope of a SAVE project “Energy Service Companies in Lithuania” in 2001-2003, and the number of companies that refer to themselves as ESCOs has remained around 6 since then (Bertoldi, Boza-Kiss, and Rezessy 2007). There are approximately 3-5 active companies, according to experts (EC JRC 2012; BioSolESCO project 2013), and these energy service and

energy supply companies are subsidiaries of larger companies and do not offer EPC as a core business. There is one local company.

There is no dedicated ESCO association in Lithuania, nevertheless there are several associations that represent the operating ESCOs, for example LITBIOMA (Association of Biofuels Producers and Suppliers of Lithuania), LSTA (Lithuanian District Heating Association) and LEKA (Lithuanian Energy Consultants Association) (BioSoLESCO project 2013).

Types of projects

Until present all projects have been implemented in heat production, and mostly encompassed the modernisation of boilers to use biofuel and other local resources. The main contractual types are leasing, BOOT, CEM/Chauffage, while EPC and guarantees are rare.

Regulatory and market factors

There are several key policy documents that prove the commitment of Lithuania to energy efficiency. The most important policy for energy efficiency is the National Energy Independence Strategy of 26 June of 2012. The Strategy describes a vision for 2050 in which socially and environmentally sustainable energy supply and use form an important part of the energy system. Furthermore, the National Programme for Energy Efficiency Improvement is an interinstitutional document prescribing the implementation details of the energy policy in line with sustainability goals. It is updated every 5 years. Finally, the National Energy Efficiency Action Plans required by the ESD and EED lay down the policies and actions that lead Lithuania towards energy savings and indicates a clear commitment to energy efficiency. The main driver of energy efficiency policy in Lithuania is the EU legislation and obligations. In spite of these forward-looking policies and programmes that take a stand on energy efficiency, no ESCO specific regulation exists in Lithuania.

However, a need for an ESCO definition or certification has been expressed by experts, because this could ensure confidence and transparency in the market. Without these regulatory clarifications, projects cannot be audited independently and disputes regularly arise from the misunderstandings or the interpretation of the contractual conditions as well as the results. This happened in a project with kindergartens, whereas the energy saving results were questioned by the client, taken to court, however the court could not take the results from the project into consideration, because the ESCO guarantee is unknown as a legal term.

Conversion of a natural gas boiler-house into a biomass boiler in Garliava, Kaunas Region



Fossil fuel dependence of district heating was decreased in Garliava when developing the first biomass installation in Lithuania using the ESCO scheme. The ESCO will operate the new boiler-house for 20 years and then transfer it to the regional district heating company.

Source:

<http://regions202020.eu/cms/assets/Uploads/Resources/130430-LEI-RES-Biofuel-Garliava.pdf>

Such cases reduce confidence in the model. In addition, the ESCO model is difficult to apply also because of the current public procurement regulations and the complexity of the procedures.

On the other hand, the second NEEAP of Lithuania reports about implemented and planned measures that have the potential help to kick-start the ESCO market. For example, quantitative energy efficiency improvement targets (EEOs) were set for electricity distribution enterprises, heat suppliers and natural gas suppliers to reduce final energy consumption by end-users by 10% compared to an earlier average consumption level (Government of Lithuania 2011), and EEOs were seen as potential drivers of the ESCO market in some other countries, e.g. Denmark, the UK, Poland.

Standard ESCO contracts were promoted in the public and private sector, though the impact is unknown (Government of Lithuania 2011).

Financing of building renovation from state grants has been common and is to be continued (Government of Lithuania 2011), and while its competition with ESCO offers has not been shown, based on the experiences of neighbouring countries, this might be one of the key barriers to the success of ESCO services.

Barriers

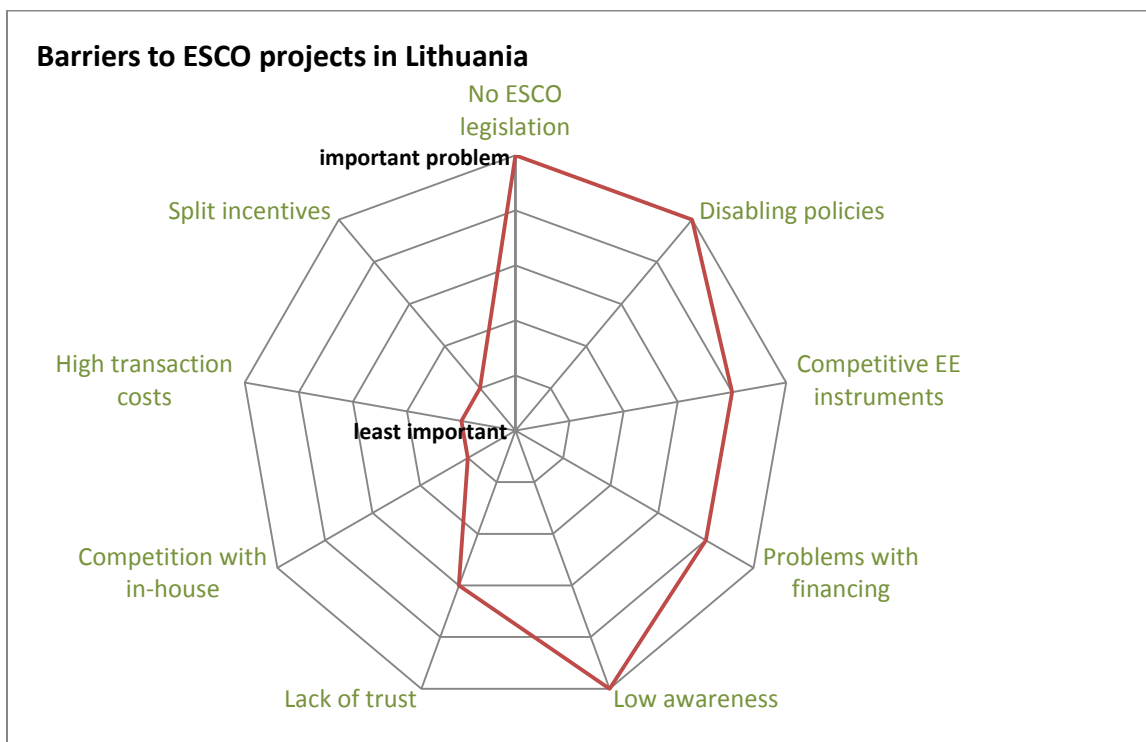
Based on the information from local experts, the key barrier to ESCO projects is the lack of trustful information about this market and opportunity, in particular the limited understanding of energy efficiency by municipalities and financial institutions. Further problem is that ESCO projects are administratively complicated, the complex and unsupportive procurement procedures create a difficult environment for ESCO project development. The accounting and settlement of services is rigid, and energy costs may be only paid towards the energy supplier, but not yet through a third party. In the public administration public budget lines are not transferrable, therefore savings in energy costs cannot be used for investments and will not increase the available budget for the building managers, and as a result there is a lack of motivation.

On the client side, there is a lack of clear division line between responsibilities of various institutions. The system of authorities is very complicated. Finally, there are no streamlined policies to support the development and implementation of efficient policies.

The financial sector has become more rigid and requires stronger securities after the financial crisis, and therefore bank loans are not attractive for ESCO projects.

It is suspected that the available financial support for building renovation in the current form of state grants might be a significant limitation to ESCO market development. These could be redesigned to ensure more successful and accountable energy renovations via ESCO or other models.

In summary, the following graph illustrates the relative importance of barriers in Lithuania:



Based on these barriers, the market has not been able to get off the ground nor can it be expected to move forward in the near future.

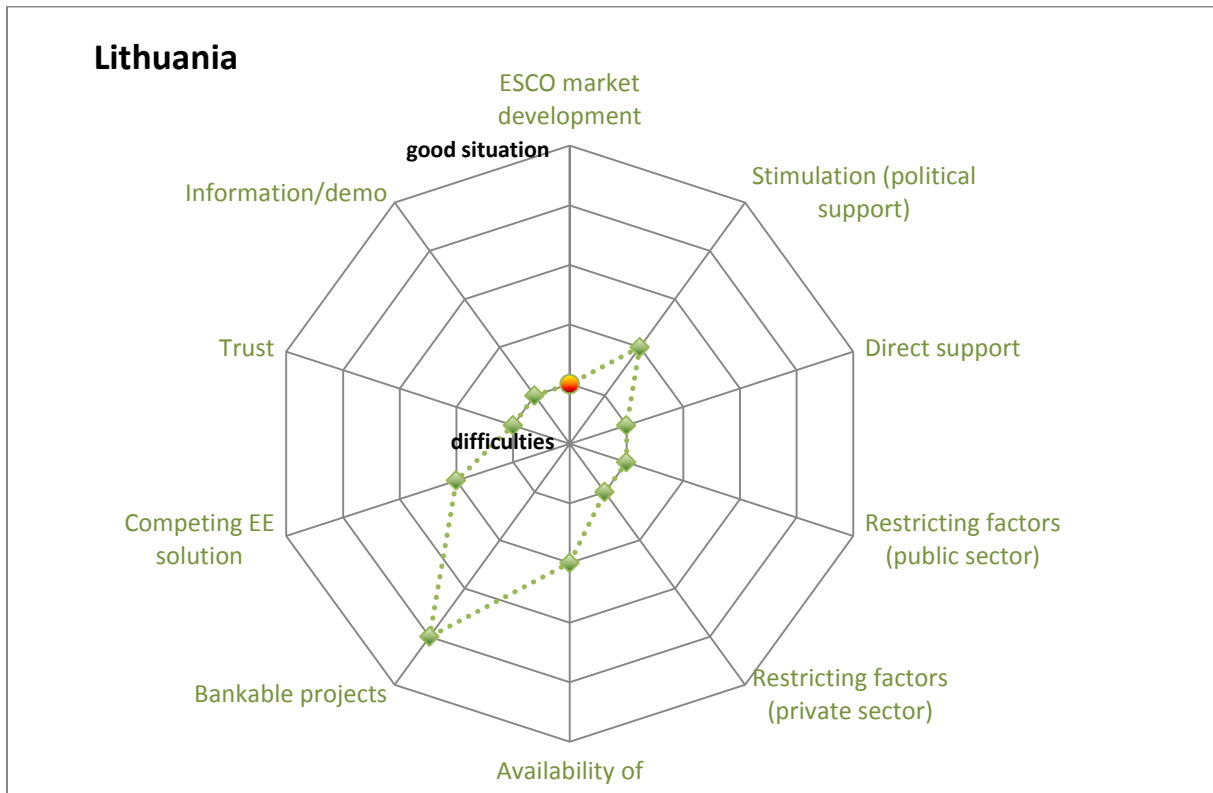
Conclusions and future expectations

As seen above, the Lithuanian market is very small and has not been changing from the early 2000s, when a few ESCO projects were started. There are always a few projects on-going, but these are often based on leasing, CEM, BOOT or other non-guaranteed contracts, aimed at the modernisation of district heating boilers. The barriers are significant and numerous and no movement is expected in the near future, unless the problems with clarity on the legal status are overcome, probably in the form of certification of ESCOs. Flexibility in accounting, contracting and an easier loan system could also contribute to a market development.

Necessary changes to start-up the market

- Drying up competing state grants or redesigning them to be compatible with client-financing and/or ESCO projects;
- Governmental support in the form of proper supporting legislation and removal of legislative hurdles;
- Increasing trust, providing information to potential clients and to the financial sector.

The following graph shows the key features of the Lithuanian market:



Lithuania in a snap-shot:

Number of ESCOs	3-5
ESCO market size and potential	market size: unknown
ESCO market trend	unchanged
ESCO association	none
Typical ESCO projects	district heating boiler houses
Main type of contract	BOOT, CEM, leasing

Luxembourgish ESCO market 2013

Information about the market or the companies working in Luxembourg is difficult to find. The ESCO market is not active, and the latest reliable information is from 2007, when 3-4 foreign companies were found to offer energy service solutions for Luxembourg (Bertoldi et al. 2010).

Current ESCO market

The number of ESCO companies today is unknown. Probably a few companies offer ESCO services and related solutions locally⁹¹, otherwise interested clients can turn to companies in neighbouring countries. On the other hand, the second NEEAP of Luxembourg claims that “as a result of the stimulation and incentives for energy-efficient building, retrofitting, living and working , the energy services market experienced strong growth in the past years” (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l’Économie et du Commerce extérieur, and Direction de l’Énergie 2011).

An international consortium carried out an assessment of the market potential of energy efficiency services (EES), and found that Luxembourg has one of the lowest potential with €5.1-6-2 million representing the additional yearly market open to EES by 2020, compared to 2010 (Duplessis 2010).

There is no known ESCO association in Luxembourg, however the creation of an office aimed at supporting the further development of the energy service market has been on the agenda (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l’Économie et du Commerce extérieur, and Direction de l’Énergie 2011). Its role would include the liaison between potential customers and service providers, establishment of information offices for energy saving contracting within the framework of the climate partnership.

Types of projects

During the last years (2010-2013) only a few projects are known to have been implemented. The second NEEAP pointed out that there have been one or more pilot projects in the public sector (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l’Économie et du Commerce extérieur, and Direction de l’Énergie 2011). The Berliner Energieagentur (BEA) (Germany) has developed EPC projects in Luxemburg⁹², to serve as pilots and demonstration projects⁹³.

Regulatory factors

An energy management system has been implemented at municipal level, which creates a long-term commitment to energy efficiency improvement. The European Energy Award system is applied in return for financial and technical support from the state (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l’Économie et du Commerce extérieur, and Direction de l’Énergie 2011).

Market factors

While little is known about the ESCO market of Luxembourg, it is likely that being a small, but energy intensive country regarding the building sector, clients can easily find offers, if not else, in neighbouring countries. It is necessary to develop the demand side, to ensure that potential clients are aware of this alternative.

⁹¹ An online industrial database, <http://www.environmental-expert.com>, lists 6 international firms that have a subsidiary in Luxembourg, of which 4 are engineering companies, 1 is a consultancy, and 1 is a financial consultant whose portfolio includes innovative financing mechanisms and solutions, suitable and available for ESCO projects, too.

⁹² amongst other smaller markets, e.g. Serbia, Monaco

⁹³ Further information: <http://www.berliner-e-agentur.de>

Interestingly, Luxembourg is linked to the ESCO business through Green Investment Schemes, whereas the country has purchased carbon credits from Estonia since 2010 under Kyoto Protocol obligations. In Estonia, housing associations implemented the energy saving renovation in ca. 600 households with or without an ESCO support. As of 2013, the scheme has stopped⁹⁴.

Awareness and trust

Luxembourg has a list of useful information campaigns (web sites, trade shows, local advice centres and training programmes) through the Myenergy initiative in order to popularize and educate about energy efficiency and renewable (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l'Économie et du Commerce extérieur, and Direction de l'Énergie 2011). However, little is disseminated about the ESCO solution itself.

ESCO profitability may be higher with the introduction of a centralized data and management system, the "Myenergy" (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l'Économie et du Commerce extérieur, and Direction de l'Énergie 2011), thus reducing transaction costs (i.e. costs of establishing the baselines). However, the actual impact of "Myenergy" is not known.

The second NEEAP of Luxembourg also mentioned that an energy service contract sample was being developed to help the public sector clients (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l'Économie et du Commerce extérieur, and Direction de l'Énergie 2011).

Financing ESCO projects

Luxembourg has already in place or planned several financial programmes for the renovation of the building sector, and for the support of renewables. No assessment is available whether these mechanisms (or any of these) serve rather as drivers (if ESCOs can benefit from the programmes, too), or barriers of the ESCO market (e.g. because of the competing nature if owners and energy managers can implement projects without the use of technical and further financial help and/or the financial programmes favour non-ESCO solutions openly). For instance, the "Think Climate" initiative is a financial aid programme for energy savings and renewable energy in housing. There are other subsidies to promote the increased use of renewables in households. Moreover, there are favourable electricity tariffs to encourage investment in CHP in commercial buildings.

In addition, according to the second NEEAP, Luxembourg plans future measures, including tax credits for notary fees, subsidised mortgage interest rates for energy efficient homes, low-interest loans for retrofitting low-energy homes, accelerated capital depreciation for tenants, and reduced VAT rates for energy efficient renovation works (Le Gouvernement du Grand-Duché de Luxembourg, Ministère de l'Économie et du Commerce extérieur, and Direction de l'Énergie 2011). Depending on the exact design, these are all able to motivate the ESCO market.

Furthermore, the Tilia Regional Fund (a German-based start-up fund manager made up of specialists in the utilities sector) of a total of €350 million was established in 2012 as an equity fund to aid investments in clean energy & environmental projects in – among others – Luxembourg, in partnership with local authorities. The Fund is supported by the European Investment Bank (EIB)⁹⁵.

⁹⁴ Further information: http://www.managenergy.net/focus_on_03_2013_fund_kred_ex.html#.UiZzsX-NCpA

⁹⁵ Further information: <http://www.eib.org/projects/pipeline/2010/20100411.htm>

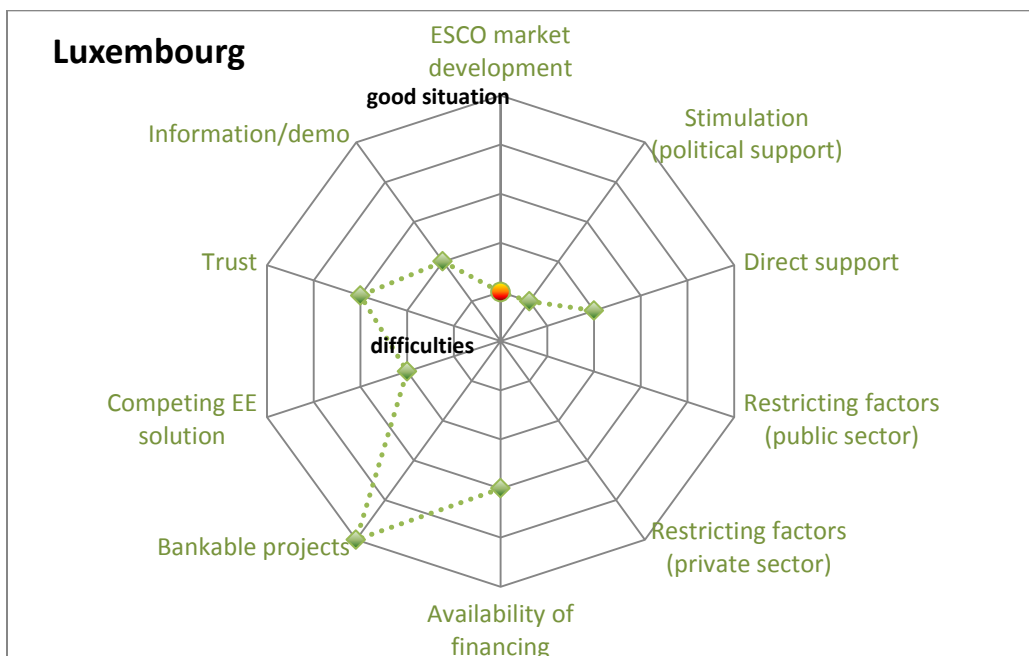
Conclusions and future expectations

The ESCO market in Luxembourg is in a beginner stage, with a minimal number of ESCO-type companies, and only pilot projects being initiated. While Luxembourg does have a clear vision about its high energy saving potential and has actively promoted energy savings through financial, informational schemes, little support has been given directly to energy services. Direct promotion through model contracts, demonstration, data collection system is in an infancy stage. Some of these measures probably compete, instead of promoting the ESCO market. Nevertheless, experts believe there has been a growth of the ESCO industry.

Key potential drivers

- Pilot projects are being implemented
- Commitment to energy savings
- Examples of ESCO promotion already being seen (such as model contracts, audits, data collection system, etc.)

The following graph shows the key features of the Luxembourgish market:



Luxembourg in a snap-shot:

Number of ESCOs 3-6

ESCO market size and potential *market size: very small*
market potential: €5.1-6.2 million

ESCO market trend growth

ESCO association none

Typical ESCO projects N/A

Main type of contract N/A

Maltese ESCO market 2013

ESCO market information about Malta is very scarce. There is a lack of ESCO companies, facilitators and experts (Bertoldi, Boza-Kiss, and Rezessy 2007; EC JRC 2012). To the knowledge of the authors, Malta has not even seen pilot ESCO projects during the last years, and political commitment to change this situation is also non-existent.

Current ESCO market

No energy service company has been located by the previous reports of the JRC (see Marino et al. 2010; Bertoldi, Boza-Kiss, and Rezessy 2007). As opposed to most of the EU countries, the second National Energy Efficiency Plan of Malta does not mention ESCOs nor does it introduce measures that could promote energy services (Malta 2011).

Furthermore, the potential of the energy efficiency services market has been estimated by Duplessis (2010), as €1.6-1.8 million annually for ESCOs, the smallest in Europe.

Conclusions and future expectations

An Energy Efficiency Fund has been created by the Ministry of Finance, the Economy and Investments to secure energy efficiency support schemes. Sources of funding include an excise duty on petrol and diesel, as well as EU Structural Funds (Malta 2011). The Energy Efficiency Fund can be considered more as a barrier than a driver to ESCOs, because potential clients are able to overcome financial barriers through applying to the fund and may disregard a market based service offer.

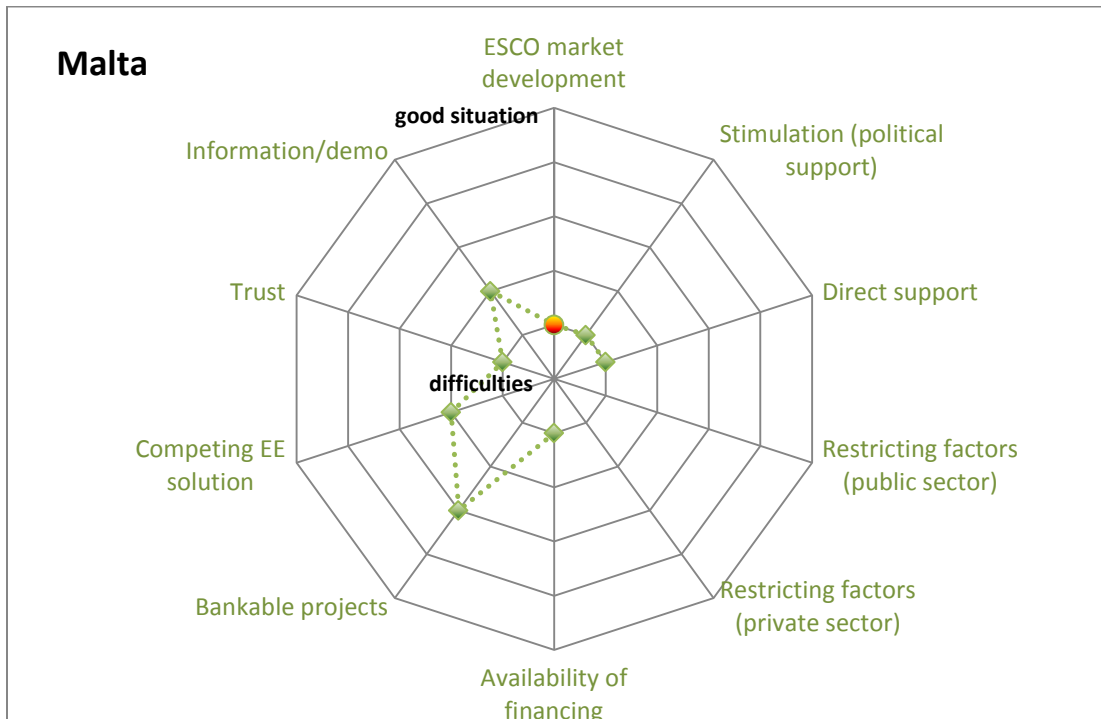
The national transposition of the recast EPBD is considered as a potential driver of energy efficiency, and potentially of ESCOs (EC JRC 2012). The implementation is aided by a number of instruments, for example, financial instruments, including rebates, tax credits and advantageous bank loans, and improved enforcement of the certification system (Malta 2011).

Provision of information and advice is also pursued by Malta, according to its second NEEAP, in particular through education campaigns, improved education of auditors, information programmes, websites of the electricity supplier and the regulator. While these measures can have an impact on the general awareness about energy efficiency, they provide little guidance on the availability and applicability of energy services.

Key potential drivers

- High renewables potential matched with a high import dependency of energy;
- Very high energy prices;
- International growth of the ESCO sector;
- Promotion of energy efficiency through policies.

The following graph shows the key features of the Maltese market:



Malta in a snap-shot:

Number of ESCOs	0
ESCO market size and potential	market size: very small market potential: €1.6-1.8 million
ESCO market trend	unclear
ESCO association	none
Typical ESCO projects	N/A
Main type of contract	N/A

Dutch ESCO market 2013

The Dutch ESCO market is a special one in Europe. While there has been some promotion and political will to establish a feasible ESCO market since the end of 1990's, little has changed, because energy efficiency has been moving ahead through other means. By 2009, the the number of energy service companies present in the Netherlands had increased to about 50, with 20 providing more extensive services (Boonekamp and Vethman 2009). Voluntary agreements, extensive services supplied by the government agency, financial and technical means, and in-house capacity supported the implementation of internally developed energy efficiency investments in the industrial sector. Energy efficiency improvements in the residential sector were enabled through standards for new dwellings,

grants, soft loans, tax relief and agreements with the actors in the field (Bertoldi, Boza-Kiss, and Rezessy 2007). In 2009, however, around 25 independent companies and 25 subsidiaries of larger organisations were found to deliver energy services with a background in construction or installation (Marino et al. 2010).

Current ESCO market

The experts interviewed for the current report estimate that the number of energy efficiency providers has not changed during the last few years and is still around 50 of which 20-30 take the financial risk through investing their own funds or through providing a performance guarantee, and can be considered as ESCOs in 2012-13 (EC JRC 2012; Boonekamp and Vethman 2009). Of these, there are local, independent companies (nine) and also subsidiaries of large international corporations (two), and nine others (construction or equipment installation companies). A slow shift can be observed from product orientated ESCOs, equipment suppliers towards broker ESCOs and ESCOs with an integrated approach (EC JRC 2012). In 2010 one ESCO was found to concentrate on transport, however recent information about this company is not available. In contrast to the above, De Boer et al. (2011) found that companies tend to slow down their ESCO services and go back to their core businesses in recent years.

Experts and available literature do not provide even a ballpark figure of the current market size. The potential of the market is estimated to be €30 million, including energy and construction costs, mainly in the scope of retrofitting projects (EC JRC 2012).

An ESCO association, ESCoNetwerk.nl has been established in 2012. They are supported by the key stakeholders and hold close relationship with the relevant Ministries.

Types of projects

The number of completed projects is limited. ESCO activities focus on new (large) non-residential buildings and dwellings, and to some extent existing dwellings. Public and commercial sectors include key clients, although private buildings receive less attention. Public administration, health-care facilities and swimming pools are the most common targets. In the industrial sector, ESCOs are limited to projects outside the core processes. Furthermore, ESCO services can be attractive for housing corporations, investors, and building managers (The Netherlands 2011), but so far partnerships with these have been rare. Municipal buildings, offices, schools, hospitals and swimming pools are most likely to offer ESCO's the best business opportunities in the future (Vreeken, Worrell, and Houwing 2012).

Combined maintenance and energy performance contracts



In addition to the provision of a complete EPC, the ESCO involved in a swimming pool project in Rotterdam is responsible for the management and maintenance of the nine municipal pools since 2011. In addition to energy cost savings and management services, additional improvements are implemented, such as improved water and air quality,

Total investment volume: ca. €3 million
Guaranteed energy savings: 34% of 2009 energy costs = €3,4 million (net present value), and a reduction of 15% of the total maintenance costs = €1,1 million (net present value)

CO₂ reduction: 2,000 t/a (corresponds to 500 homes)

Contract duration: 10 years

Source: <http://www.esconetwerk.nl/Projecten-Database/2/>

The construction and renovation works usually involve energy efficient architectural design and equipment, CHP, heat and cooling provision, pumps, insulation, furthermore operation and maintenance. Other renewables as alternative energy supply sources are also well received in projects.

EPC is the most preferred ESCO contract mechanism, largely through guaranteed savings because of the risk aversion and limited trust by potential clients. Furthermore, integrated contracts which combine efficient construction and renewable energy supply are sought by clients (EC JRC 2012). Besides, CEM or BOOT formulae are also applied.

ESCO services are typically offered as a supplementary product, and the companies are not yet experienced and have a limited knowledge of this business, resulting in potentially unsuccessful projects (Vreeken, Worrell, and Houwing 2012).

Regulatory factors

The Dutch government fully applies the concept and practice of sustainable procurement, which also implies that only energy efficient offices with an energy label C or better can be rented or bought. This was expected to have a substantial driver effect on the demand for ESCO projects, but it has not been proven. On the contrary, for the moment public administration moves its offices into more efficient, but previously vacant buildings, and does not influence the overall building stock. Public procurement practices have been changing drastically in recent years. Previous practices hindered the development of the ESCO market due to a major focus on initial costs, but the central government and local governments started to implement the Total Cost of Ownership (TCO) or Total Cost of Use criteria, whereas they choose offers that produce lower life-cycle costs. They have also started to require a longer term contract, where the contractor maintains contact with the client, and provides maintenance. These changes open up the market for ESCO-type businesses.

Furthermore, the recently introduced energy performance certification of buildings increases the transparency of energy consumption and operational costs become visible for interested parties and provide a standardised and relatively cheap means of monitoring of energy savings realised by ESCOs. However, the obligation of having an energy performance certificate at the moment of sale is not enforced yet.

The 'Activiteitenbesluit Wet Milieubeheer' regulation will oblige parties to take all energy efficiency measures with a pay-back time with a maximum of 5 years. While it is not fully enforced yet, it has very good potentials to help the ESCO market development.

The Netherlands has had a system of voluntary agreements, MeerJarenAfspraak (MJA), introduced in 1992. The goal is to achieve energy efficiency improvement for final users. The group of target end-users have been regularly changing. At the moment both the ETS and non-ETS sectors are included. While there is a strong resemblance, the MJA is not a White Certificates system or an Energy Efficiency Obligation, partially due to its optional nature.

The Dutch energy policy always lingers a "threat" of (continuously) tightened requirements, and this also drives energy efficiency improvements ahead. Experts believe that an ESCO could help customers to be prepared and be aware of the upcoming new regulations.

In summary, there are no direct legal provisions for ESCOs in the Netherlands, standards on energy efficiency services do not exist and there is no explicit promotion. This situation should not hinder the ESCO market, though, because at the same time, legislative limitations are also largely absent (for

example the unequal treatment of projects implemented by owners and outside companies in other countries⁹⁶).

Market factors

Due to the existence of competing solutions for the improvement of energy performance, such as voluntary agreements, financial grant schemes, and comparable services supplied by the government agency, etc., the ESCO market in the Netherlands emerged very late. Even today, energy efficiency improvement is mostly done without the intervention of ESCOs.

Awareness and trust

Information about the ESCO models is limited, and often provided to the clients by the ESCOs themselves, rather than by independent stakeholders. It has become common that the large ESCOs seek independent small consultants to back-up their proposals with a kind of “seal of approval”, independently verifying the claims made by the ESCO.

Demonstration projects, successful examples are not widely available, and dissemination of their lessons is not yet in practice. Agentschap NL, the agency of the Dutch government for environment and innovation, provides independent information on ESCOs and model-EPC-contracts on their website⁹⁷. With the establishment of ESCoNetwerk.nl and an expected development of a Code of Conduct, this situation may improve. The association provides information about completed and ongoing ESCO projects on its website⁹⁸.

Environmental awareness is part of Dutch private and working life. Corporate Social Responsibility (CSR) is taken seriously, also as a result of the ‘ProRail CO2 prestatie ladder’ policy. This instrument stimulates companies who participate in public tenders to reduce their carbon footprint, because their score on the ‘carbon ladder’ influences their chances to win a public project (De Boer et al. 2011).

Financing ESCO projects

The second NEEAP of the Netherlands reported about several financial and fiscal schemes that could provide a positive environment for ESCOs, because they are available both for the owners and the implementers (e.g. ESCOs) of the energy efficiency projects (The Netherlands 2011). A unique, temporarily reduced VAT rate on labour costs associated with insulation and renovation increases the profitability of ESCO services. Furthermore, companies that invest in energy saving measures can apply for a tax grant, Energie-investeringsaftrek (EIA). In 2011, the total budget for the EIA was €151 million (De Boer et al. 2011). Nowadays some ESCOs successfully use the EIA-grant. Despite reported abolishment, a support scheme, the “green fund”, a preferential loan with 1% discount on the interest rate for ‘green’ investments is also available to be combined with an ESCO model (EC JRC 2012; De Boer et al. 2011).

Earlier a guarantee fund was considered by the Dutch government. In September 2013, a covenant on sustainable energy supply has been agreed (Energieakkoord) with about 40 parties, which incorporates provisions that transpose the Energy Efficiency Directive (EED).. In the Energieakkoord parties have also

⁹⁶ see for example the chapter on Germany in this report

⁹⁷ www.agentschapnl.nl/esco

⁹⁸ <http://www.esconetwerk.nl/Projecten-Database>

agreed on setting up a revolving fund of €600 million for financing energy efficiency measures in households.

From the proceeds of the sale of utilities (NUON, Essent) a number of regional revolving funds have been established; f.i. 'Energiefonds Overijssel' and 'Amsterdam Investeringsfonds'. Under certain conditions these funds can be used for investments in energy efficiency projects in utility buildings and in households.

Barriers

One of the key barriers of the ESCO market on the Netherlands is the lack of reliable information and the lack of examples. This results in a continuing deficit of trust and unfamiliarity with the concept. Some projects prove less successful than expected due to the lack of proper knowledge and experience of the contractors.

In the Netherlands, ESCO projects are complex as compared to alternatives (e.g. own investment using a grant support), and are therefore considered expensive. There has been a problem with high transaction costs and the establishment of baseline data, and the prospective monitoring system of the projects. A lack of accepted standardised measurement and verification procedures deepened the problem of trust. Many private non-residential energy consumers (in collectively rented buildings) have no meters installed (Vreeken, Worrell, and Houwing 2012). These problems are believed to be partially overcome with the introduction of building certificates.

Split incentives hinder the ESCO investments because the owners are not allowed to share or pass on the investment costs and integrate these into the rents directly. While the value of the property also increases as a result of an ESCO project, which can influence the renting price in future rents. This is however not as widely acknowledged and not enough for driving the ESCO market.

Finally, given the large investments already carried out in the field of energy efficiency using alternative solutions, the low-hanging fruits have been implemented through own projects, using grants or soft loans, etc. This leaves the ESCOs with economically less attractive projects.

In summary, the following graph illustrates the relative importance of barriers in the Netherlands:



Conclusions and future expectations

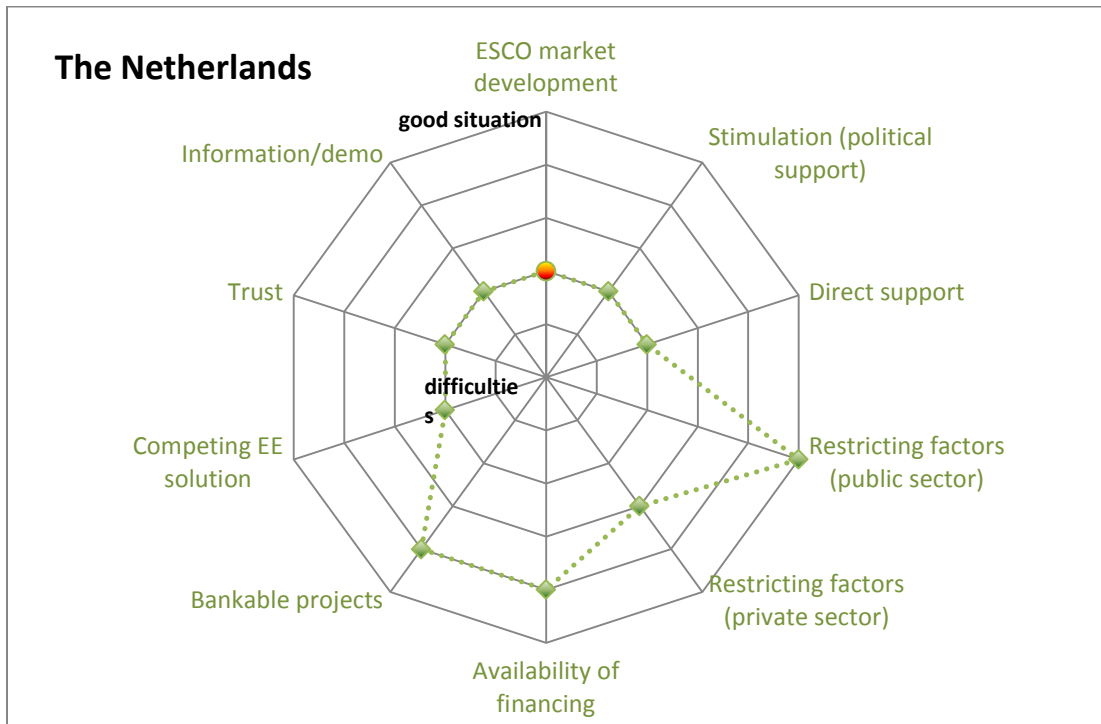
The Netherlands provides an example of how the ESCO concept can gain ground with favourable market conditions and few barriers from the regulatory framework. On the other hand, the Dutch market also shows the signs of a quick draw-back or slowing down, as the market has not yet been able to move forward its initial ignition. Technical aspects are provided and trusted, however the ESCOs experiences with complete ESCO packages is limited, and the financial schemes need to be more developed to earn the clients' trust. The establishment of a guarantee fund could be a crucial step forward in this regard.

The future of the Dutch ESCO market is hard to predict and much will depend on the government's commitment, on the introduction of policy measures that may be beneficial for ESCOs depending on the design, as well as the learning curve of the companies and the growing environmental interest of the potential clients.

Key drivers

- 100% sustainable procurement;
- Changing procurement practices towards life-cycle cost consideration and requirement for long-term maintenance;
- VAT reduction for labour related to energy-related refurbishment;
- Lack of most legal barriers;
- Growing environmental awareness.

The following graph shows the key features of the Dutch market:



The Netherlands in a snap-shot:

Number of ESCOs	50 ESCOs, of which 20 take financial and/or credit risks
ESCO market size and potential	market size: unknown market potential: €30 million/year, including energy and construction costs
ESCO market trend	slowly increasing and getting off the ground
ESCO association	ESCoNetwerk.nl
Typical ESCO projects	public and commercial sector new public buildings, some renovation projects, special private constructions, such as swimming pools
Main type of contract	EPC (mostly guaranteed savings) and CEM

Polish ESCO market 2013

Expectations that the Polish market would get off the ground have been high a number of times during the last two decades. Today, again, seems to be a moment of opportunity related to the remaining vast technical and economic potential, the introduction of White Certificates, the obligation of local authorities to implement energy efficiency actions in order to access energy auctions, and the intensive promotion of ESCOs/EPC through the newly established ESCO Club.

Current ESCO market

There are around 30 ESCO-type companies in Poland (EC JRC 2012; Guła, Pytliński, and Zaborowski 2012), which indicates an increasing market, including several new ESCOs that were founded since 2010. Nevertheless the number of actually active companies is still under or around 10. The market is still in its infancy, and most of the ESCOs struggle to get off the ground (CombinES project n.d.). The growth during the last 2 years is due to the natural growth of the energy efficiency market, the increased pressure from European legislation and national legal developments (e.g. the Energy Efficiency Act, NEEAPs, energy efficiency obligations), as well as due to the drying-up of EU funds (EC JRC 2012); however the rate of market expansion is below what would be expected based on the increasing energy prices and the supportive policies (Guła, Pytliński, and Zaborowski 2012).

The most active ESCOs are branches of three foreign companies (EC JRC 2012). But there are many local small companies offering ESCO services, though typically not as a core business, and there are “special purpose entities” founded by local utility companies (Guła, Pytliński, and Zaborowski 2012; EC JRC 2012).

The current market size is estimated to be at least €10million (EC JRC 2012) in annual turnover, while some experts calculate with up to €25million (Guła, Pytliński, and Zaborowski 2012⁹⁹; JRC survey 2012). The turnover was projected to grow from 2012 based on tenders already published and investments realised in the private sector (Guła, Pytliński, and Zaborowski 2012). ESCO representatives had plans to invest €25-75 million annually in the future (Guła, Pytliński, and Zaborowski 2012), while one of the largest ESCOs calculated with a market size potential of €120 million (EC JRC 2012).

Types of projects

While the ESCO concept is said to be well-known and “admired” (CombinES project n.d.), EPC has not been a successful scheme in Poland. Even so a few contracts have been concluded since 2010. Third party financing is not popular in Poland, and ESCOs with large internal funds that can provide project financing from their own equity remain in the center of the market or apply forfeiting.

Most of the ESCOs operate in the district heating sector, lighting, public lighting, improvement of controls and building envelope (EC JRC 2012). Some ESCOs offer a wide range of services, while others focus on only one end-use (such as street lighting). Heating investments are particularly attractive for ESCOs, including fuel oil or gas boiler replacement with biomass (Guła, Pytliński, and Zaborowski 2012). However, on the demand side, the customers are more interested in energy management systems and other “additional” services.

ESCOs provide services for the public sector, the commercial sector, the energy sector, industry, small and medium enterprises (SME) and even to households (Guła, Pytliński, and Zaborowski 2012). The public sector constitutes about 40-50% of the ESCO market turnover, making it the largest client, (Guła, Pytliński, and Zaborowski 2012), and the volume has been slowly increasing. Main target subsectors are education buildings, local administration buildings, street-lighting (EC JRC 2012).

Largest expected savings are in the industrial sector due to “economies of scale”, short payback time, and interest of decision makers. However, this is mostly done through leasing and similar, more traditional transactions instead of guarantee-based EPC (Guła, Pytliński, and Zaborowski 2012).

⁹⁹ based on a local expert survey in 2011.

Private buildings, in particular households, represent significant reduction potentials. Households hold a particular interest in TPF, because of the lack of internal funds and national/EU funding schemes. ESCO services in the commercial buildings sector are largely limited by the landlord-tenant split and because of the reluctance to outsource (Guła, Pytliński, and Zaborowski 2012).

Regulatory factors

On the one hand, the road to a successful ESCO market has been largely paved by new regulatory changes, set in motion by EU directives, while on the other hand survey respondents indicated the conservative Polish regulations as major barriers (EC JRC 2012).

The primary supporting policy is the Act on Energy Efficiency of April 2011 (Ministry of Economy 2007). This act introduces an energy obligation on suppliers of electricity, natural gas, and district heating, in the form of a White Certificate scheme. Under the scheme entities (i.e. ESCOs) may enter tenders to obtain energy performance certificates (white certificates). These energy savings can be aggregated on behalf of other entities which carried out an energy efficiency improving investment (Ministry of Economy 2012). Implementing ordinances were published during autumn 2012, as a result of which about 26,000 toe/year energy savings were reported in the end-use sectors within the first round of the scheme (Zmijewski 2013). A green certificate scheme (GCS) and a red certificate scheme (RCS) for cogeneration are already in place (Boonekamp and Vethman 2010).

The Public Finance Act is a major obstacle for development because it classifies ESCO projects as normal loans¹⁰⁰, therefore increasing the public debt if a public entity engages in a project, in spite of the fact that they actually reduce the financial liabilities of local governments through lower energy consumption (EC JRC 2012). In effect, a public tendering of ESCO services is a catch 21 situation: while authorities have an obligation to implement energy efficiency actions in order to access energy auctions (Guła, Pytliński, and Zaborowski 2012), their booking practices cause liquidity problems. Public private partnership agreements could be a basis for larger flexibility that could enable pure EPC contracts (CombinES project n.d.).

Market factors

Poland has been experiencing a natural growth of the energy efficiency market (driving the limited growth of ESCO services), resulting from the energy price increase (EC JRC 2012).

One of the main reasons for the low ESCO activity in Poland until now the discouragement from a few fruitless tenders (CombinES project n.d.). Companies and potential clients invested in these, but then the contracts were either dropped before the start or were concluded with one-sided contractual terms.

Awareness and trust

An informal coalition of business and professional bodies to promote ESCO market, the so-called “ESCO Club” was established, and meets regularly since 2011. Their ambitions include promotion and communication with decision makers (I. of E. E. IEE n.d.).

¹⁰⁰ to be changed in 2014

Financing ESCO projects

Third Party Financing (TPF) is not used much in Poland, partially because of the low activity of the financial sector in this area and partially due to the complexity of legislation and procurement rules in relation to ESCO projects. Therefore, ESCOs with large internal funds succeed over small firms because they are able to sustain all parts of a project (engineering, management and financing). This also results in non-standard ESCO contracts, often disregarding the guarantee part.

Barriers

The technical potential of energy efficiency and of EPC is vast (CombinES project n.d.); however significant legal and financial barriers still prevail. The most crucial problems are:

- There is a significant legislative risk in the changing legal environment. The government plans to replace the currently valid certificates with a new system, but the details are unknown yet to the market. As a result, it is risky to start a project that builds on the current certificates, therefore the market is waiting.
- Considering ESCO projects as general debt element, which limits the ability of the public sector to engage in energy efficiency projects. The financial crises has further increased this problem, because the public sector is even more limited in taking debts (EC JRC 2012);
- Complicated public procurement rules and overly complex processes. These rules focus on first cost and thus hamper the selection of best bid on the long term (BioSol 2010);
- Public funds (typically from EU Structural Funds) were competing with market-based ESCO offers until they dried up (Guła, Pytliński, and Zaborowski 2012). It is not yet clear, whether after these funds disappeared the ESCO market will get stronger or energy efficiency investments will be even more limited;
- The market is not yet demand driven, but rather ESCO companies set the scene and offer contracts that may not reflect clients' needs best. The market experienced many failed tenders due to the mismatch of clients needs and ESCO offers earlier. Further awareness raising may be able to overcome this problem by enabling clients to better formulate their needs and better understand the complicated ESCO contracts;
- While PPP has been identified as the opportunity to overcome some of the barriers (ensuring guarantees, matching client-contractor preferences, financing barriers, increasing trust, etc.), there is a reluctance and a lack of clear legislation in this direction (Guła, Pytliński, and Zaborowski 2012).

In summary, the following graph illustrates the relative importance of barriers in Poland:



Conclusions and future expectations

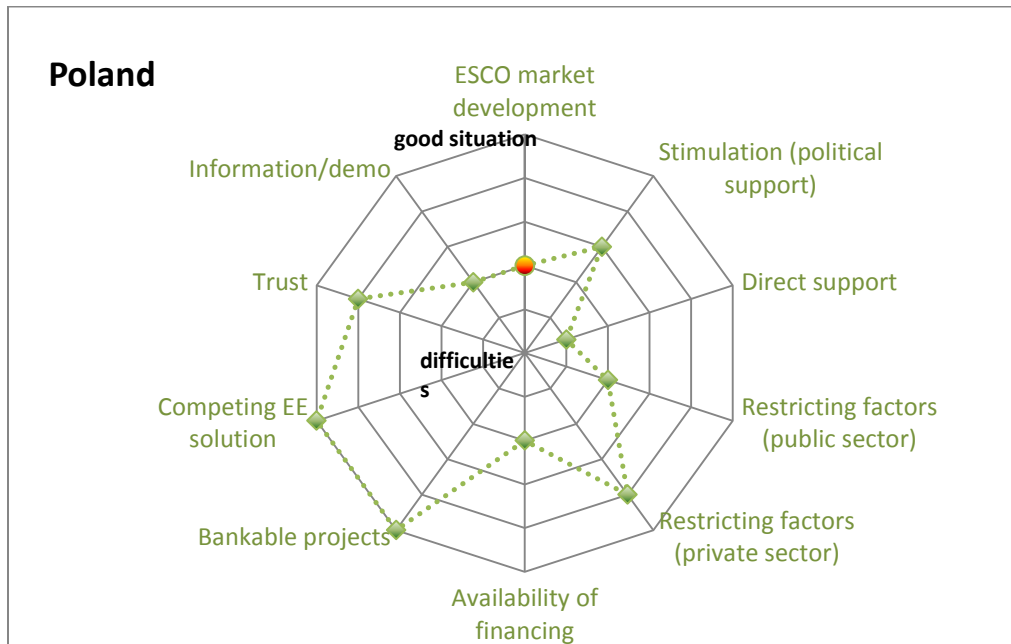
While Poland has been expected to develop a successful ESCO market several times in the last decades, it still seems to be lagging behind counterparts with similar markets. However, as of 2012, there are several promising signs of development. In particular, there is a continuing interest from all parts (clients and contractors), with changes in the enabling legislative environment, and a removal of some barriers (such as low energy prices, innate reluctance to outsource, lack of trust).

Possible break-through points

- The Energy Efficiency Act;
- White Certificates System;
- Drying up of competing public funds;
- Increased awareness raising activity.

The Energy Services Directive and the Energy Efficiency Directives have been indicated as crucial drivers in the development during last years (EC JRC 2012). Survey respondents believe that further EU policies, for instance mandatory renovation rates could further improve the ESCO market in Poland. Establishment of guarantee funds are seen as a crucial element in order to transform the currently vague market towards more guarantee-based ESCO contracts (EC JRC 2012).

The following graph shows the key features of the Polish market:



Poland in a snap-shot:

Number of ESCOs ca. 30, of which ca. 10 are active

ESCO market size and potential market size: €10-25 million annual turnover
market potential: €25-75 million

ESCO market trend getting off the ground

ESCO association none

Typical ESCO projects space heating, air conditioning, control and automation, lighting.
building envelope projects are increasing
public sector buildings

Main type of contract BOOT, outsourcing (guarantee is often excluded)

Portuguese ESCO market 2013

The Portuguese ESCO market was known to be relatively small and to operate with 10-12 companies as of 2009, after a steady, though slow increase during the preceding 4-5 years (Marino et al. 2010).

This solid growth has continued during the period 2010-2013, in spite of the struggle of the real estate and the industrial sectors (the latter being one of the main clients) (EC JRC 2012).

Current ESCO market

The number of ESCOs that actually operate currently is estimated to be about 15-20, which is the result of a gradual increase of the market (EC JRC 2012). The potential pool of contractors is much larger,

whereas more than 100 companies are registered as certified auditing companies in the official database established by the Directorate General of Energy and Geology in 2009¹⁰¹.

There are a number of factors that have been contributing to this rising trend, including the political and policy making attention on energy efficiency and in particular on ESCOs, the rising energy prices, and the new ESCO association.

APES Energia¹⁰², an association for energy service companies was established recently (April 2011). The association has 7 founding members and 3 more affiliates have joined later. While they aim at attracting more in order to cover the whole industrial segment, 70% of the total ESCO business in the period 2010-2013 is done by the members.

Active companies are typically local or national companies, often small-sized firms, whose core business is energy services. Nevertheless, facility management and small engineering companies are also found on the ESCO market. Large energy distributors (i.e. international companies) are rare and newcomers. They are known to establish dedicated ESCO sisters in Portugal with a small team of 10-20 people to break into the market with the promising upcoming ESCO market opportunities.

An estimate of the current market size is not available. The market potential is believed to be €100-200 million which reflects the energy efficiency projects that have a payback time of maximum 10 years (EC JRC 2012).

Types of projects

Traditionally, the key ESCO clients have come from the industrial segment in Portugal (EC JRC 2012) and this sector is still the most interesting for ESCOs. Recent public programmes have raised an interest in offering ESCO services for the public sector, however the success of these is to be seen, and some experts indicated that prescribed, strict conditions in the contracts may reduce ESCOs potential profits and thus interest in these projects (EC JRC 2012). Hospitals and restaurants have also been popular targets.

There were some public lighting ESCO bids for big cities, like Coimbra, that could also open the way towards other type of projects for ESCOs. Public lighting represents 60% of the total energy spending of local authorities in average in Portugal.

From industrial projects towards building refurbishment



Hotel Corinthia in Lisbon is luxury hotel, which has a large visibility. This was intendedly used as a motivation during the complex energetic renovation of the building. The hotel has changed the lighting systems, the motors and equipment, HVAC system and automation, while widely promoting energy savings amongst employees and guests, as part of the first large scale EPC project in Portugal. During the renovation, the hotel was fully functional.

Achieved energy savings: -22% final energy, i.e. 2.02 GWh/year

Source: Ferreira (2013)

¹⁰¹ <http://www.dgeg.pt/>

¹⁰² <http://www.apese.pt/index.php>

Installation and operation of renewable energy supply solutions have been the main technologies offered by ESCOs, which is now moving towards more integrated projects (including both supply side and demand side technologies, and even the motivation of behavioural changes).

ESCO projects are expected to be realised in the scope of the Eco.AP programme (see below): the first phase of the program (2012-2015) is planned to cover the ESCO-mediated refurbishment of ca. 300 buildings with a total of 700 GWh/year baseline energy consumption, reflecting a €75 million/year energy bill (MARIE project 2012). The potential savings from these projects are around €14 million per year. The ESCOs are required to guarantee savings, and take a certain degree of financial risk. Contract periods are expected to vary between 6 and 16 years.

While the number of ESCOs and companies that are interested in the ESCO business has increased dramatically, Energy Performance Contracting is gaining popularity only lately. Therefore EPC can be considered as a new business product, and companies are in the learning process. When it comes to EPC, the shared savings model is preferred and clients and ESCOs share risks.

Regulatory factors

Portugal advanced significantly in regards the establishment of targeted programmes and legislation to improve energy efficiency and in particular energy services during the period of 2010-2013. A supportive and accountable legal framework was established, including a “diploma” regulating the activities of energy service companies and legal conditions were defined for establishing EPCs in 2011 (EC JRC 2012).

In the same year, the Eco.AP programme was launched. The programme aims at achieving an average of around 30% energy efficiency improvement in the government buildings, including public companies, state-owned properties, universities, and public foundations, etc. by 2020 (MARIE project 2012; EC JRC 2012). On the other hand, many experts have expressed reservations about the size of the expected savings as well as about the easiness of participation (EC JRC 2012).

It is required that the public budget should not be loaded with the investment costs of the renovation, but the energy services solution (or other market-based variants) should be used. All in all, the Eco.AP programme is a complex initiative, based on technical measures, as well as behavioural change, training and information dissemination. Finally, the results should be measureable and should contribute to the national energy efficiency targets. A large number of ESCO companies or ESCO-type companies with a capacity to offer ESCO services registered in order to be able to participate in the Eco.AP tenders (EC JRC 2012). However, the programme could not be started yet, because the market does not have these financing capacities. It was proposed that paying guarantees should be issued by the Portuguese State in order to secure the investments, but decision has not been taken.

European legislation and especially the National Energy Efficiency Action Plan have been recalled as major drivers of the ESCO market, as these have provided an incentive to introduce building certification, national ESCO legislation, grant schemes and support programmes (EC JRC 2012).

Market factors

The industrial segment of the existing ESCO projects is driven by market forces through the existing (usually private) demand, whereas the recent growth is rather the result of the improved legislative background and political and structural incentives.

Awareness and trust

A need for information and experience dissemination is innate in the Portuguese market. Facilitators (Ministries, Universities, the National Energy Agency, ADENE, ESCO associations) and interested companies regularly promote the ESCO solution amongst potential clients and decision makers via conferences, trainings and written material.

In 2009 the Directorate General of Energy and Geology (DGEG) established an ESCO database, where companies can apply for certification with the primary goal to validate potential tenders in the public procurement process of the Eco.AP programme (see also above). This has contributed to the increased trust in the market. The Eco.AP programme provides further information about the market. A publication and measurement procedure – the Barometer of Energy Efficiency – was created to disseminate information and motivate an increased energy performance amongst public administration buildings (MARIE project 2012).

Financing ESCO projects

Financing has been either ensured by the clients (industrial customers) or provided by third parties. As described above, Portuguese ESCOs are traditionally small, and therefore financially less viable companies. Therefore the new entrants in the form of sister companies of large international energy providers/distributors represent a significant competition because these enjoy the financial stability and investment potentials of the mother companies (EC JRC 2012).

Commercial banks are not open for energy efficiency projects, and do not possess relevant portfolios, therefore do not participate in the ESCO market. Nevertheless, ESCOs and facilitators regularly approach banks and it is hoped that collaboration will be established and ignited in the near future (EC JRC 2012).

Traditional market players will have to find their way to finance their projects effectively to enjoy the market opportunities opened by the Eco.AP programme, whereas the client (the public building operator) will not have the financial means to support the project. The economic and financial crisis has reduced the overall financial resources for these companies (EC JRC 2012), and the earlier funds that provided benefits for renewable energy investments are coming to their end. National energy efficiency policies and EU directives (in particular EPBD 2010/31/EU, EED 2012/27/EU) require a search for new funding mechanisms. In this line, an Energy Efficiency Fund (PNAEE) was also launched recently that is available also for ESCOs, however it has only a modest budget to be distributed (EC JRC 2012). The Fund is managed by the Energy Agency, ADENE. A recent tender has been opened for project proposals for residential, public and industrial buildings (under the Fundo de Apoio à Inovação) to test the ESCO construction for the Eco.AP programme. The selection of the demonstration buildings and the contractors is to be concluded during 2013 (Lúcio 2013).

Barriers

The Portuguese ESCO market has evolved during 2010-2013 as a result of public programmes and the enacted legislative changes, the lack of appropriate financial resources and access to capital is probably the most crucial barrier. The economic crisis has worsened the situation, causing a freeze in investment budgets, as well as a decrease in banks' investment interests. National banks lack funds and international banks are not interested to be associated to the Portuguese risk. Moreover, financing institutions need to have a better knowledge about the financing typologies and contracts, as well as about the technologies to be installed, in order to facilitate more adequate leasing contracts. Lack of

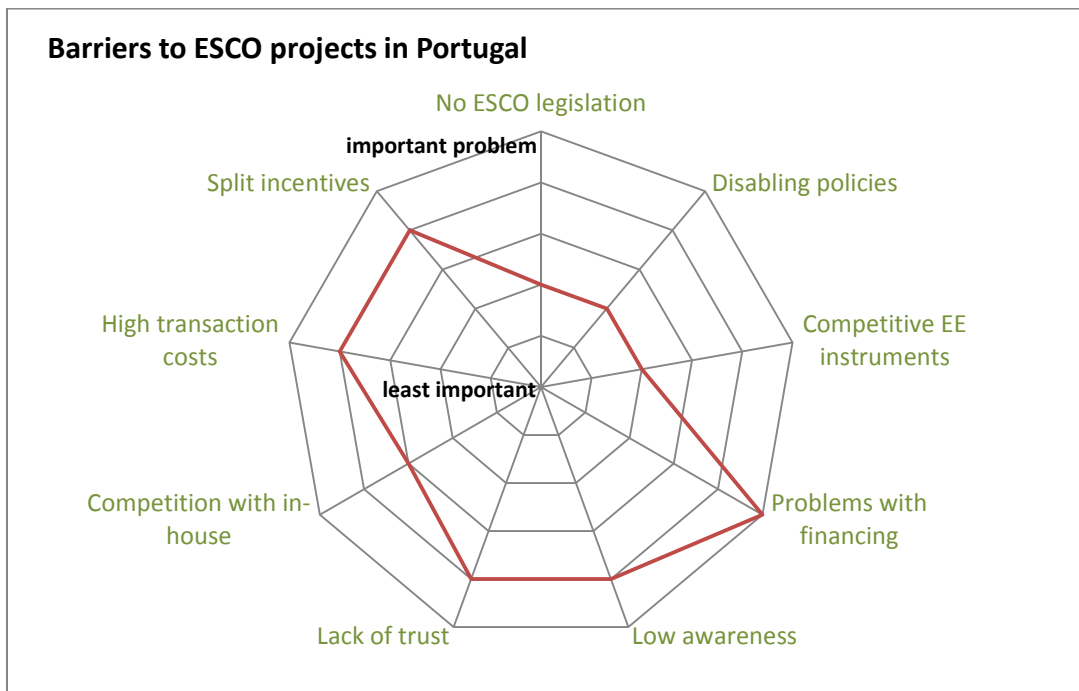
financing for projects by traditional, small ESCOs may result in the restructuring of the market with a shift towards utilities and international ESCOs that have the support from the mother company.

Costs are high due to the small project sizes, especially as the market is moving towards buildings and demand side technologies, which are more distributed than large industrial and RES projects.

Customers are still reluctant to engage in an ESCO contract due to the long term contracts and the limited knowledge about the concept. There is an aversion to outsource energy management and to allow an outsider to investigate the internal issues of an entity.

To summarise, lack of financing resources, mistrust from the potential customers, lack of credibility of energy services providers and reluctance to long term contracts are among the main barriers for the development of the ESCO market in Portugal.

In summary, the following graph illustrates the relative importance of barriers in Portugal:



Conclusions and future expectations

The Portuguese ESCO market is on a rise since ca. 2005. Overall, this increase has been modest. Recent increase has been more enhanced, partially due to the increased motivation of the market through the establishment of the proper and supportive legal environment and the targeted Eco.AP programme that focuses on the employment of market based refurbishment of public buildings via ESCO services, thus ensuring a reduction of public spending on energy bills in parallel to empowering companies and professionals in this sector.

The market structure has been transforming in parallel:

- the type of ESCO projects: changing from largely industrial orientation towards building refurbishment and from mainly renewable technologies towards demand side interventions, or integrated projects;

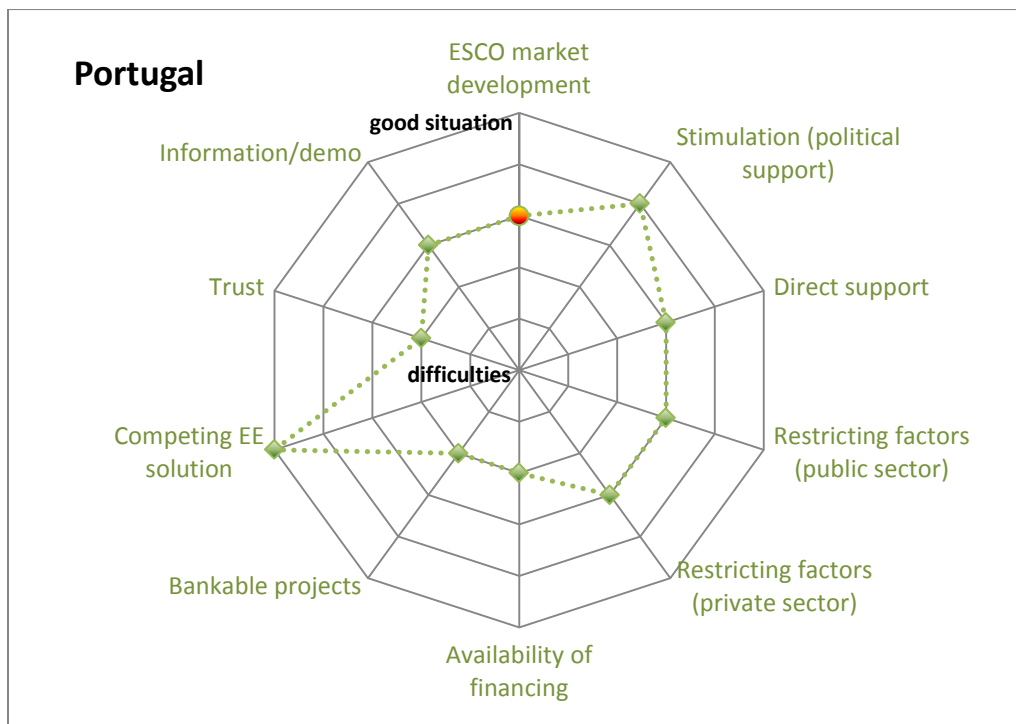
- the type of companies: only small and local companies dominated the market previously, while there is a growing interest from utilities and international energy distributors;
- financing: investments ensured by clients and from renewable energy funds were typical before, while now third-party financing and energy efficiency fund will start to lead.

The key problems to be solved are related to the establishment of appropriate financing mechanisms. The success of the currently introduced Eco.AP programme and the future of the ESCO market may depend on the ability of the ESCOs and clients to raise funds. A guarantee fund that could provide for a commercial bank loan is seen as a crucial next step in the development. Experts suggested that such a fund could operate at EU level. National programmes have been typically short-lived in Portugal, which causes instability and contributes to the lack of motivation and reluctance to engage in long-term contracts. The success of the current exemplary ESCO framework will depend on many factors (EC JRC 2012).

Key drivers

- national legislation and accreditation system;
- Eco.AP programme that requires public buildings to be revamped by ESCOs;
- interest by new players, including utilities and international energy distributors;
- Energy Efficiency Fund;
- continuous awareness raising and information dissemination in order to increase trust;
- EU legislation and the resulting national support for energy efficiency.

The following graph shows the key features of the Portuguese market:



Portugal in a snap-shot:

Number of ESCOs	15-20 active ESCOs, but over 100 companies are registered in the official database
ESCO market size and potential	<i>market size:</i> unknown <i>market potential:</i> €100-200 million/year, including energy efficiency projects with less than 10 years payback period
ESCO market trend	slowly increasing
ESCO association	APESenergia
Typical ESCO projects	industry, hospitals, restaurants, public buildings RES and integrated projects (moving towards demand side technologies)
Main type of contract	EPC (mostly shared savings) and CEM

Romanian ESCO market 2013

While the ESCO market of Romania was in an embryonic state until around 2007 (Bertoldi, Boza-Kiss, and Rezessy 2007), development and progress was registered during the period 2007-2010 (Marino et al. 2010). The first ESCO was created with EBRD support in 2008¹⁰³, whose demonstration was followed by new and private – mostly local – entrants. Some foreign companies became also interested in tapping the large energy efficiency potential and several joint ventures were established. As of 2010 already 14 active ESCOs were known, and this number further increased in the years 2010-2013 (EC JRC 2012).

Current ESCO market

As of 2013, around 15-20 companies exist in Romania that regularly offer energy services (EC JRC 2012), which is combined with a growing demand for ESCO projects (Romania 2011). ESCO companies are mostly local and national companies (or joint ventures of local and foreign stakeholders), but there are also international ESCOs with locally established sister departments. The majority of the ESCOs are small entities. In spite of the growing access to offers and interest on the demand, the volume of actually running ESCO activity is limited. Companies that work in the ESCO

First trigeneration plant in Romania



A high efficiency cogeneration plant fuelled from the local biomass was built in 2012 in Gherla city located in the central part of Romania by a local leading Romanian furniture manufacturer in partnership with an ESCO. The ESCO will be responsible for operation for 10 years. The project was financed from the client's own equity and using EU funds.

It is expected that the furniture company will benefit from this cogeneration plant ca. 1,23 MWe and ca. 7 MWt for its own technological use of the power and heat.

In 2013, the partners decided to extend the plant to recover more heat and to upgrade the installation into a trigeneration plant.

Source: *Energy Serv (2013)*

¹⁰³ Previously, in 1993 USAID also initiated work on the ESCO market by enabling 5-6 newly created consultancy companies that were intended to become real ESCOs. These companies were very active in marketing and promoting energy services, however the limited access to financial sources hindered the establishment of ESCO projects afterall. (Rotaru 2009)

business are consulting and engineering firms, equipment producers, manufacturers and retailers, facility managers and energy suppliers. There are only privately owned companies. ESCO offers are focused on the planning, implementation and operation phases, while financing is offered by only few companies.

The growth of the market is known to be the result of improved legislation as of 2011 (see more below) and the facilitation mediated by international financial institutions, such as EBRD, USAID, World Bank/GEF and UNDP/GEF in the form of financial incentives, loans, technical assistance and information dissemination.

The size of the market and an estimate of the potential are not publicly available, even though new entrants often assess these for themselves before engaging in the ESCO activity (EC JRC 2012).

An ESCO association has not been established yet in Romania.

Types of projects

Existing (running and planned) ESCO projects use the BOOT or the Energy Supply Contracting. The BOOT contract proved its feasibility both in implementing and operating cogeneration based ESCO projects. EPC projects are rare, mainly because of the reluctance from the potential clients, primarily the hesitant public sector (EC JRC 2012). EPC in the form of guaranteed savings contracts are only developed in the industry on small to medium sized projects.

Public lighting projects have taken place, but building renovations were not common. During the period 2010-2013, ESCOs report to have projects also for healthcare facilities, hotels, offices, and retail (EC JRC 2012). District heating projects were in the focus for one ESCO, through a wide range of integrated services which improve and optimize the clients' equipment (EC JRC 2012).

Previous project focus has been on large industrial and boiler installations, substitution and maintenance. Renewable projects have been also common, such as wind-farms, solar installations, CHP and biomass-based energy generation and distribution. Demand side actions have not yet been popular, but local and international actors hope to facilitate a development in this field.

To boost EPC type investments, the EBRD launched a dedicated project in 2013. The project focuses on intensive information dissemination about EPC, investigation of the legislative background, in particular the procurement regulations and practices, as well as the general enabling framework and secondary legislation. The project will entail discussions with stakeholders, trainings, development of model contracts and tendering demonstration (EC JRC 2012).

As a result, leading municipalities will implement EPC projects. This is dependent on a strong decision-makers' support, the success in real-life application of energy efficiency procurement and the use of standardised documents with the arrangement of EPC projects off the balance-sheet (Vlad 2011).

Most of the ESCOs provide audit and consultancy services, but are limited in their ability to finance large projects (EC JRC 2012).

Regulatory factors

The primary legislation relevant for ESCOs and EPC is well-developed in Romania today (EC JRC 2012). Indeed, the legislation was promising since 2000, when the Energy Efficiency Law no.199/2000. was

introduced, which was a strong basis for ESCO projects. However, shortly after, the Fiscal Code meant a serious barrier for new ESCOs by removing the beneficial fiscal conditions for them.

The following years saw a lot of activities on the part of local stakeholders, the Ministry of Industry and Resources, as well as international organisations via assessing the market conditions, organising trainings and discussions, developing demonstration projects, etc.

Finally, the crucial step was given by the introduction of the Government Ordinance (GO) 22/2008 that modifies the Law no. 199/2000 (and transposes the Directive 2006/32/EC) by providing a political commitment to EPC. At the moment, this regulation defines the National Energy Policy, furthermore it defines ESCOs, energy services, EPC, and financing instruments for EPC-projects (Rotaru 2009).

Further supportive framework is ensured by

- Government Decision (GD) 163/2004 that defines the National Energy Efficiency Strategy (targets);
- GD 1661/2008 that identifies efficiency measures (incl. EPC);
- the National Strategy for Energy Efficiency;
- Ministerial Order no .1767/2009 by the Ministry of Economy to allow externalization of energy management from all energy consumers under the obligation to have authorized energy managers;
- Support schemes for high efficient cogeneration by the Romanian Energy Regulatory Authority (ANRE)¹⁰⁴ (EC JRC 2012).

Some of the advantageous changes from the above regulatory framework came into effect from January 2011. ESCOs indicate better conditions since then (EC JRC 2012).

Market factors

Romania has experienced significant drop in final and primary energy consumption during the past two decades largely due to autonomous changes. Final energy demand has been impacted by growing prices in all sectors and efficiency improvements mainly in the industry. Furthermore power generation has experienced major works on fuel switch and efficiency improvement (ABB 2011).

Awareness and trust

Information and demonstration has been taking place from the early years, and continues so. As shown above, discussions were rather regular in order to understand the core barriers, including major stakeholders, such as Ministries and the procurement agency (ANRMAP).

FREE, the Romanian Energy Efficiency Fund¹⁰⁵, was established by the World Bank, GEF and the Romanian Government and operates since 2004 to increase energy conservation activities and implement measures with a demonstrational impact in Romania. FREE is also dedicated to increase the banking sector's interest and capacity in the field (Rotaru 2009).

International organisations have almost always combined their financing products with training or information dissemination to increase the effectiveness of the imported credit lines.

¹⁰⁴ Certain experts criticize the scheme as being too loose, and finance CHP installations that are not highly effective, and thus diluting the value of such a financial aid (EC JRC 2012).

¹⁰⁵ <http://www.free.org.ro>

Several workshops and international/EU projects have also contributed to the increased availability of information, generating an increased demand and interest. However, clearly, there are major other barriers that need to be overcome.

Financing ESCO projects

International Financing Institutions (EBRD, USAID, World Bank/GEF and UNDP/GEF) have been active in Romania in supporting general energy performance improvement and ESCO projects in particular. Three related programmes run currently: The Energy Efficiency Finance Facility (EEFF) offers loans for banks, the EBRD Energy Efficiency Finance Facility (RoSEFF) provides loans to energy efficiency investment projects, and the SME Sustainable Energy Financing Facility (Vlad 2011). These appear in the country in the form of integrated packages, i.e. combined with non-financial support (e.g. technical assistance).

Furthermore, EU Structural Funds have also been used for energy efficiency, but there is no information whether ESCO projects have been common amongst these.

Banks engage in energy efficiency projects based on these external support mechanisms, otherwise there are several obstacles to commercially viable loans on market basis only (EC JRC 2012). In the municipal sector municipalities do not have the financial capacity to take a commercial loan due to the lack of off-balance sheet solutions (Rotaru 2009). The municipality is limited by a maximum lease credit (given as a percentage of its total budget), and an ESCO project would appear as an equipment investment. On the other hand, the ESCO (especially the small, local ESCOs) is also unable to claim the investment on its own balance sheet, because after a few projects it would fill up its creditability. Maybe a mixture of financing variants could be a solution (Rotaru 2009).

The market track record shows that only a small number of projects of €1 million or above have been financed, because the Romanian banking system lacks expertise and knowledge regarding the energy efficiency sector. Despite this, experienced finance providers in energy efficiency projects have come to provide support for the Romanian ESCO market.

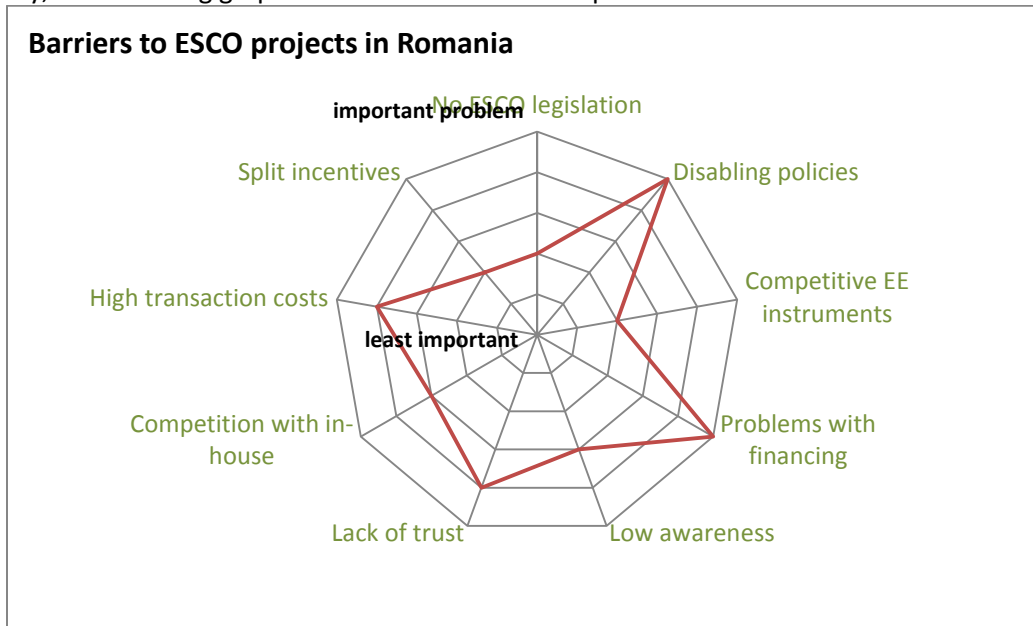
Barriers

The ESCO business development process is slow and difficult due to a series of constraints:

- There is a lack of trust on the part of customers caused by the lack of awareness of the ESCO concept and energy efficiency business culture. In order to stimulate the ESCO market, on the long run the Romanian ESCO market still needs education, information dissemination and demonstration projects;
- While the primary legislation is exemplary in relation to defining, supporting and accepting the ESCO concept and EPC, the actual implementation details and secondary legislation is lagging behind;
- Public procurement rules - although significant improvement has been made over the past years, the procurement process is still too complex, ambiguous and time consuming for the local ESCOs. EPC is not regulated in public procurement contracts which make bids for energy rehabilitation of buildings and / or public street lighting systems non-accountable.
- A solution for off-balance sheet financing of projects, or an alternative in combining ESCO-client financing is to be sought. The EBRD initiative to test tendering and provide model contracts may result in a successful step in this line;

- Financing of ESCO projects through third-parties is currently possible only with the use of foreign capital. Banks are still reluctant to provide investment support; they do not see the financial potential in energy efficiency projects;
- Municipalities are hesitant to engage in ESCO projects due to the financial risk they perceive and the lack of financial solutions suitable for them, as well as due to the complicated procurement process. Progress has been achieved with ANRMAP, which may remove or reduce this problem;
- So far, ESCO projects have rarely been demonstrated to be profitable without external grants, on a market basis, and this questions the overall kick-start of the market after the dedicated credit lines dry up.

In summary, the following graph illustrates the relative importance of barriers in Romania:



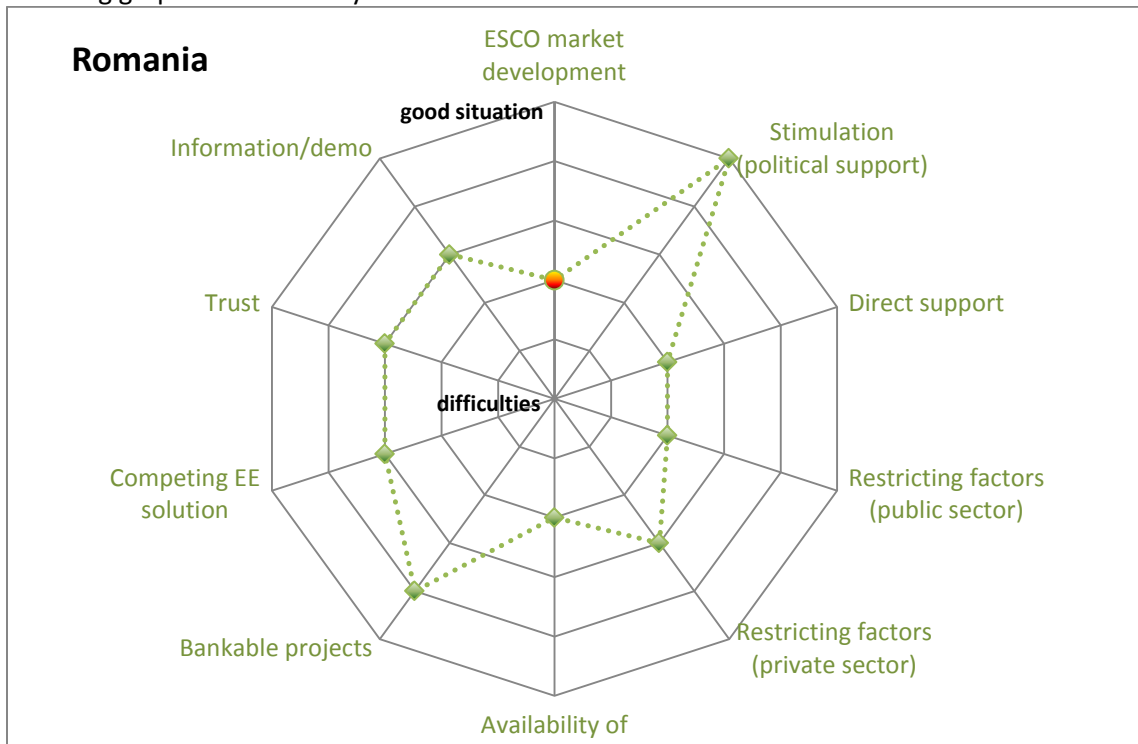
Conclusions and future expectations

The ESCO market in Romania is still small, but has experienced a slow increase and changes in focus. Industrial and supply side projects have been and are still most popular, and therefore the supply oriented contracts dominate. EPC and demand side measures face numerous barriers, mainly related to the availability and accountability of financing and reluctance from the clients. This is being addressed by dedicated primary legislation, which may be considered as exemplary and rare in Europe, combined with initiatives by international organisations to provide technical, financial and informational assistance to develop particularly this respect of the ESCO market.

Key drivers

- national legislation;
- EU legislation;
- IFI activity, including dedicated credit lines in complex packages;
- intensive and open discussions with relevant stakeholders and active search for solutions;
- successful promotion and information dissemination.

The following graph shows the key features of the Romanian market:



Romania in a snap-shot:

Number of ESCOs	15-20
ESCO market size and potential	market size: unknown market potential: unknown
ESCO market trend	slowly increasing
ESCO association	ESCOROM - the Romanian Association of ESCO Companies
Typical ESCO projects	industry, hospitals, hotels, retail, public buildings RES, boilers, public lighting
Main type of contract	BOOT and Energy Supply Contracting limited volume of EPC

Slovak ESCO market 2013

The ESCO market in Slovakia emerged already in the 1990s. However, ESCOs did not perform very well then and confidence in the concept was low, thus the market came to a halt, and restarted only around 2003 (Marino et al. 2010). As of 2013, the ESCO market is still embryonic, although there are several suppliers which offer delivery contracting and/or EPC. While delivery contracting has been slowly growing continuously, there have been a few EPC projects, too since 2012. The stakeholders in Slovakia believe that the market can be expected to grow in the coming years.

Current ESCO market

In 2010, around 5 ESCO companies¹⁰⁶ were present on the market (Marino et al. 2010), but as of 2013, there are 20-50 companies that are able to carry out ESCO projects (EC JRC 2012)¹⁰⁷. of which only 6-8 really have projects (EC JRC 2012). The most active ESCOs are 6 big companies that are branches or daughter companies of international corporations (usually technology producers). Opinions differ on the number of heat producers that can provide ESCO services as an additional product: their number may be between 10 and 50, and there are a few (3-5) independent ESCOs that provide EPC and/or delivery contracting and/or facility management as their core business (EC JRC 2012).

The market is experiencing a smooth growth driven by demand.

The size of the energy efficiency market in the non-residential sector was estimated to be €10-20 million in 2010, while the public sector energy savings potential in 2012 was estimated to be 5 PJ, that is €60 million/year (CombinES project n.d.). No calculation of the energy services market or the ESCO market potential has been carried out lately (EC JRC 2012).

At the moment there is no association that could represent or support the ESECO market, nevertheless the Energy Center Bratislava plays an important role in promoting the ESCO model through a number of national and international projects. For example, a National Steering Committee was established by the EESI project¹⁰⁸, which is composed of ministries, Office for Public Procurement, regions, municipalities and ESCOs. Currently, there are discussions between the Center and several ESCOs about the establishment of an association (EC JRC 2012).

Types of projects

The most common contract type has been delivery contracting or heat supply contracting, where the ESCO takes over the heat management and supply, providing the service at a lower cost than the cost of the heat used to be before the project (Lauko and Nicz 2013; EC JRC 2012). The private sector (industry) and the public sector are the main targets of these ESCO projects. Delivery contracting has been continuously increasing.

The ESCO and EPC concepts are said to be known (Berliner Energieagentur GmbH 2012a; EC JRC 2012). About 20-30 projects were realized between the 1990s and 2003, although some did not perform well and therefore EPC lost its popularity (Bertoldi, Boza-Kiss, and Rezessy 2007). During the period 2010-

ESCO project in Hnúšťa, 2008



The Town of Hnúšťa received the award for “Best Energy Service Project” at the European Union Sustainable Energy Week (EUSEW) 2012 in Brussels. The project involved the installation of a new system of hot industrial water preparation, and the installation of new renewable energy systems (solar energy) that can be used in the municipal heat supply system.

Source: Berliner Energieagentur GmbH (2012) and RENesco (2013)

¹⁰⁶ Other sources estimated around 30 companies at this period (IFC 2011).

¹⁰⁷ Other sources estimate a maximum of 20 companies, though the difference may be the result of a different scope of the ESCO definition (EC JRC 2012).

¹⁰⁸ European Energy Service Initiative, supported by IEE; ran between 2009 – 2012; <http://www.european-energy-service-initiative.net>

2013, EPC started to regain interest. Activities in the public sector started in 2012, when an 18 years-long contract for 74 secondary schools with guaranteed savings was initiated in the Košice region by one of the large ESCOs. The investment volume of the project is over €2.5 million. As of 2013, 6 EPC projects were implemented (EC JRC 2012).

While EPCs in the 1990s were focused on district heating optimisation, EPCs today are targeted at educational and health facilities. During the last years, building envelope renovation, lighting improvements, pump and motor efficiency improvements were started. Energy saving is often not the (only) motivation of a renovation project in the public sector, but instead clients aim at increasing hygiene, improving or simplifying operation, and increasing safety.

Regulatory factors

The basic legislation of ESCOs exists and creates the conditions for further development of energy services activities (including EPC) (Berliner Energieagentur GmbH 2012a), however other regulatory acts represent a significant barrier.

ESCO activity is regulated by the Energy Efficiency Act 476/2008 Col., which defines energy services, since 2008. The Act also lays down the obligation to conduct energy audits in industry and agriculture (EC JRC 2012; Government of Slovakia 2011).

The Special Act on heat power industry drastically hampers ESCO activities. This act limits possibilities for the implementation of EPC within the district heating systems, because a heat producer can sell heat as a commodity, but not as thermal comfort. It does not allow payments for energy savings.

Public procurement rules are also important for public sector ESCO projects. While the usual hurdles exist when procuring energy services, it is possible to include a possibility for negotiation after the selection of the best bidder, and the selection should not be based solely on the first costs (Lauko 2013). On the other hand, the regulation restricts the transferability of cost savings between budget lines, and therefore destroys motivation for energy cost savings. It has been observed that EPCs have been carried out in 2-3 subsequent contracts to overcome regulatory hurdles.

The National Energy Efficiency Action Plan (2011 - 2013) proposed a few promising measures to support energy services (Berliner Energieagentur GmbH 2012a; Government of Slovakia 2011), such as:

- the e2, a program of education in state administration;
- proposals for legislative actions, including a plan to revise the Energy Efficiency Act 476/2008 Col. with focus on rights and duties related energy services;
- energy advisory
- and a horizontal measure, "Support of Energy Services Utilization", which should coordinate various measures that influence the successful utilization of energy services. Beside, the measure also envisages the drafting of a common methodology for the public sector about the practical implementation of energy services projects (EC JRC 2012).

Market factors

The delivery contracting part of the ESCO market was successful in spite of the regulatory hurdles resulting from the heat supply act, and could constantly develop on a market basis. As for EPC, as soon as the direct subsidies provided for building renovation from EU Structural Funds have dried up, the market ignited its natural demand for ESCO services.

Awareness and trust

Slovakia has various support programmes to provide advice, training and information about energy efficiency in general and about the benefits of ESCO projects (Government of Slovakia 2011). Though several programmes that were planned in the first National Energy Efficiency Plan were cancelled, such as the Energy Efficiency Fund, there are important others that came to life, such as the energy auditor trainings, public agencies, E2 training programme for state officials, etc.

There have been a series of training events in all eight regional capitals of Slovakia to inform potential clients (municipalities and national and regional authorities), and to enable them to meet with ESCOs and financial institutions (Berliner Energieagentur GmbH 2012a).

Financing ESCO projects

Lack of appropriate forms of finance remains an important barrier to ESCO projects. For the public sector, low credit ratings cause a problem due to high level of debt.

On the national level, the EUROSTAT accounting of EPC projects is understood as counting EPC projects as normal debt and thus to contribute in the national deficit. This seriously limits the willingness to engage with and support EPC at political level.

Nevertheless there exist some commercial banks that are willing to provide financing for energy service projects (Vacho 2013), and industrial projects are often paid from the client's or the ESCO's internal funds.

Barriers

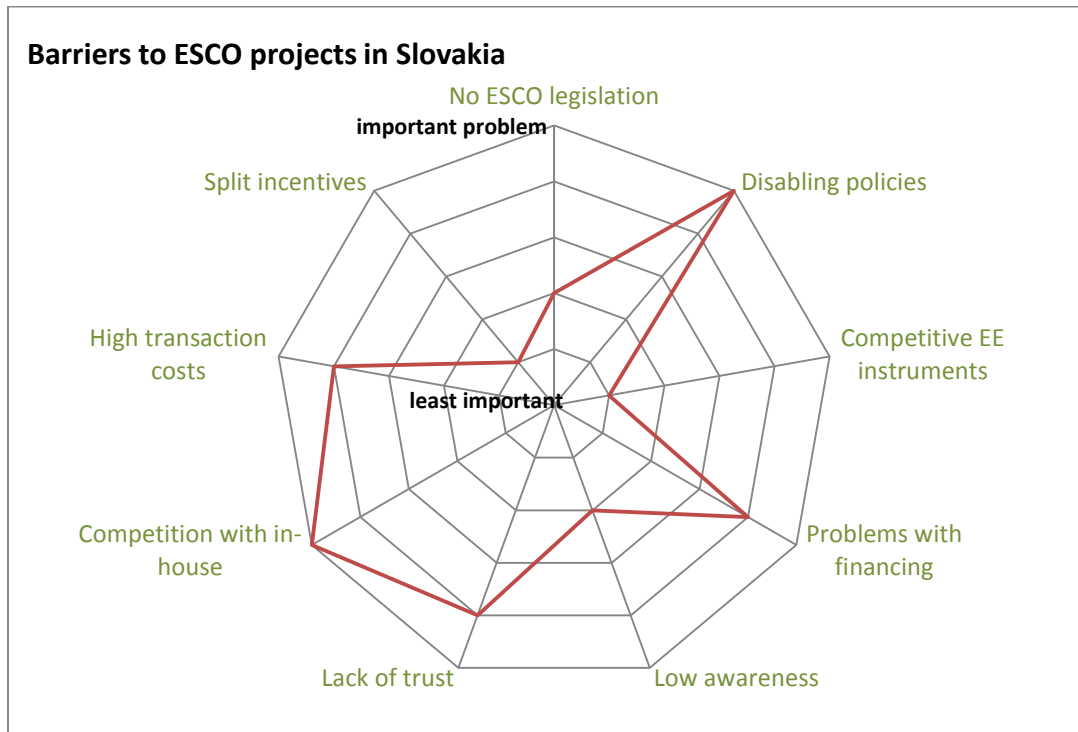
The list of barriers is long, although it has changed much during recent years. Previously, the predominant barriers were regulatory hurdles for heat supply contracting, and the availability of national grants that competed with market-based EPCs.

As of 2013, regulatory hurdles are the most crucial, because heat can be sold only as a commodity, but not as a service according to the heat supply act. The accounting of energy services as part of the national deficit blocks political support.

The financial capacities of parties is another key barrier, even if banks would be willing to provide TPF. Many municipalities have a level of debt that causes liquidity problems for them. On the other hand, some clients and banks can participate in projects with their own funds.

Furthermore, there is a continuing mistrust based on the earlier failed projects, although this situation is improving as the number of successful projects is increasing (Lauko 2013). The complexity of the ESCO offer is also thought to deter clients.

In summary, the following graph illustrates the relative importance of barriers in Slovakia:



Conclusions and future expectations

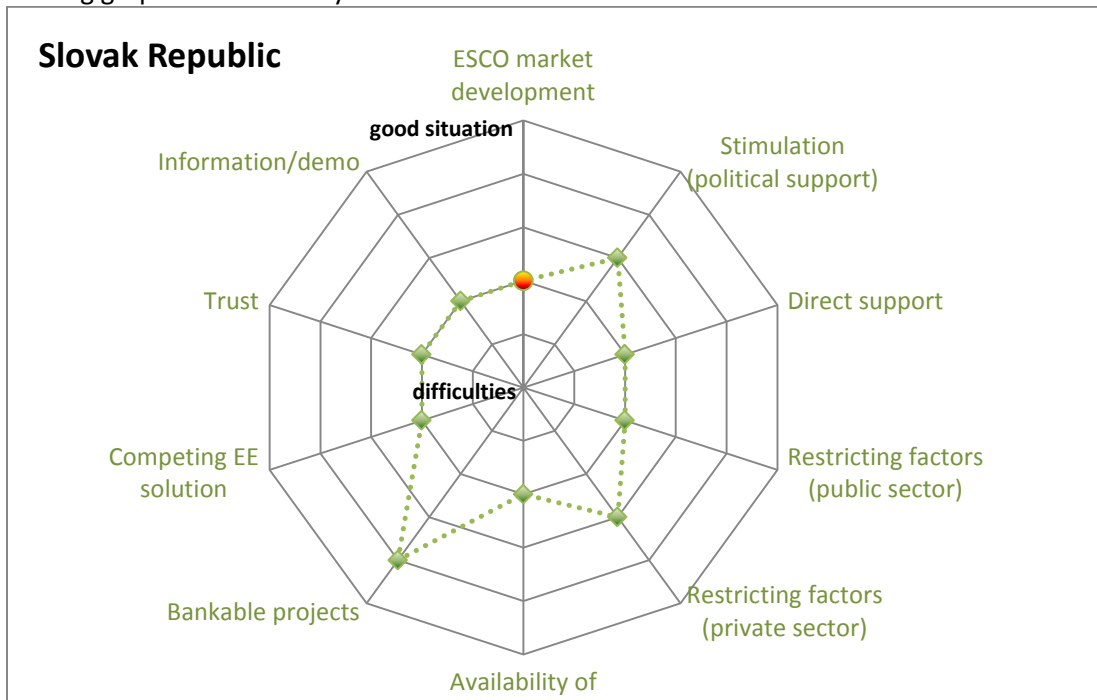
Slovakia saw some preliminary success of its ESCO market activity already in the 1990's. About 20-30 EPC projects were implemented in the public building sector between 1995 and 2005 (Bertoldi, Boza-Kiss, and Rezessy 2007; EC JRC 2012), while energy contracting was continuously on a rise. When national subsidies were available from EU Structural Funds (2003-2009) for energy efficiency, and legal hurdles were introduced, the ESCO market was interrupted. EPC was not used any more, but in spite of these barriers, the market could still operate on the basis of heat supply contracts.

Industrial projects continue to slowly develop, and the public sector EPC projects are projected to gain interest. Since 2012, successful EPC projects have been done. There are several barriers that need a solution soon in order to support the ESCO market, including budget-line transferability and liquidity problems in the public sector. A number of key regulatory barriers should be lifted, while there are signs that the policy-maker has designed policies that are in favour of the market development. An ESCO association may emerge in the coming years.

Key drivers

- demand driven projects in heat supply;
- overcoming regulatory barriers with – for example – consecutive contracts instead of one complex contract;
- drying up of competing national grants;
- information dissemination.

The following graph shows the key features of the Slovak market:



Slovakia in a snap-shot:

Number of ESCOs	6-8 active companies
ESCO market size and potential	market size: unknown market potential: unknown
ESCO market trend	slow growth and a restarting EPC market
ESCO association	none
Typical ESCO projects	space heating, control and automation, lighting industry and public sector buildings
Main type of contract	Heat supply contracts (CEM) are most common, EPC emerging

Slovenian ESCO market 2013

The ESCO market of Slovenia was reported earlier as small with a few local companies that offered energy services as a side business. In spite of the foreign interest in parallel, the ESCO market was not able to emerge successfully until recently (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010). Marino et al. (2010) expected a moderate growth as a result of active political attention on environmental protection, including building and lighting legislation, voluntary agreements linked to CO₂ tax exemptions, and the use of structural funds to provide support for ESCO projects, amongst others.

Current ESCO market

During the period 2010-2013 a slight increase in the market activity and the number of players has been seen, and the number of registered ESCOs has grown from 2-3 to 5-6 (EC JRC 2012), nevertheless it can be still considered as underdeveloped (Staničić 2010). Only one of these companies offer guarantee based contracts on a regular basis, the others will rather qualify as ESCO-type companies or ESPCs (EC JRC 2012). These companies are all local or national, moderately sized ESCOs that are consulting firms, engineering companies or equipment manufacturers/suppliers that offer energy services as an additional business opportunity to their core activities (EC JRC 2012). A further increase is expected in the coming years because of the increasing interest in energy efficiency and the recently introduced energy saving obligation scheme (EC JRC 2012), which is already indicated with the increased activities of energy utilities that offer energy services, which are visible since 2011.

BOOT contracts and EPC are known, with mostly shared savings in the latter case (EC JRC 2012). Indeed most of the projects carried out previously were imported via EU projects, such as ClearContract¹⁰⁹, ChangeBest¹¹⁰, European Energy Service Initiative (EESI)¹¹¹, etc. There are some supply contracts recently (Staničić 2010). These projects have taken place in the public sector (buildings, street lighting), restaurants, hotels and industry. No ESCO association exists in Slovenia, but there are first signs and discussions about a potential need for it (EC JRC 2012).

The current size of the market is estimated to be €3 million/year, including construction costs, based on the information from the energy saving obligation scheme, and opposed to a €15 million market potential (EC JRC 2012).

The second National Energy Efficiency Action Plan of Slovenia prescribes a renovation rate of the public buildings as 3% per year, using “more progressive forms of energy efficiency services, such as energy contracting plus and integrated contractual assurance of energy savings” (Republic of Slovenia 2011). The government has also considered the use of Cohesion Funds for the strengthening of the ESCO market through providing incentives for projects with long payback periods that could not be profitable, but which provide additional value in the form of – for example – complex renovations (Republic of Slovenia 2011). There is currently no information about the implementation of this measure.

Conclusions: barriers, future expectations

The slow growth of the Slovenian market at the moment is expected to accelerate or at least keep pace. The most important barrier has been the financial incapacity of the market, which was previously overcome by support programmes. The public sector – used to subsidies – has not found a practical way and trust in the ESCO solution to get really engaged, although there could be financial solutions available. As of today, there are some banks that are willing to cooperate in the support of ESCO projects and recognize EPC as a specific product. While all commercial banks shrank significantly after the crisis around 2009, and the loans were frozen, a transformation can be seen in recent years towards targeted investment portfolios (Staničić 2010; EC JRC 2012). The currently ongoing ELENA co-funded project in the city of Ljubljana is watched with high anticipation and its outcome will certainly have an impact on further market development, at least as far as the public sector is concerned.

¹⁰⁹ <http://www.managenergy.net/resources/261>

¹¹⁰ <http://www.changebest.eu/>

¹¹¹ <http://www.european-energy-service-initiative.net/>

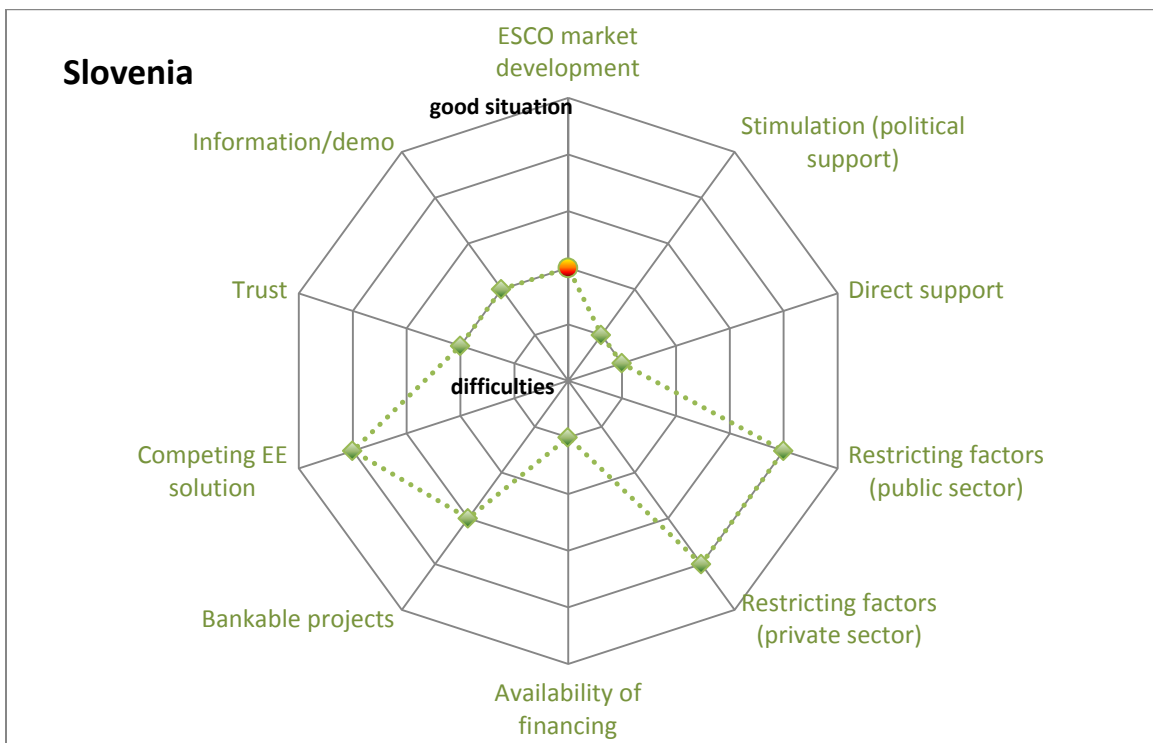
Liberalisation of the energy market has not been completed successfully yet, which hinders ESCO services and electricity prices are subsidised in some sectors.

The construction sector has been expected to serve as a vehicle for ESCO development, but the local construction companies are not ready and not financial capable to invest in upfront costs and engage in projects where they have to wait years to recover the investments (EC JRC 2012).

There is a mature legal framework for energy and energy efficiency; however energy services are not directly addressed. Above all, the previously beneficial regulations for EPC (whereas EPC projects were not accounted into the municipal debt quota) was changed and the advantage of ESCOs was stopped (Staničić 2010). As a result the contract period of ESCO projects had to be increased and a higher risk is now associated with these contracts. Furthermore, public procurement law is still a significant barrier due to complexity and regulations on contract period limitations (Staničić 2010). The business activities of ESCOs are not clear and not accountable, because there are no specific business codes for them. If these codes were assigned, their business could be regarded as service by the tax office and fall under a different tax category than installation, financial product, delivery of goods or construction. Trust and recognition would significantly increase.

- Potential drivers could be**
- more attention on energy efficiency;
 - business codes for ESCOs and ESPCs;
 - increase trust and understanding of ESCO services, and therefore create a demand;
 - reconsider regulations on contract period limitations in the public sector;
 - energy saving obligations.

The following graph shows the key features of the Slovenian market:



Slovenia in a snap-shot:

Number of ESCOs	5-6
ESCO market size and potential	<i>market size: €3 million/year, including construction costs market potential: €15 million</i>
ESCO market trend	slowly increasing
ESCO association	none
Typical ESCO projects	municipal buildings mostly supply side technologies (CHP, biomass, district heating)
Main type of contract	EPC with shared savings, BOOT, supply contracting

Spanish ESCO market 2013

The Spanish ESCO market is still considered to be small, nevertheless it has been increasing steadily both in the public sector, mainly with local and autonomies authorities, and in the private sectors. It was driven by large national programmes during the periods 2005-2007 and 2007-2010 and registered a continuous, though slow growth then (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010), with a fast leap between 2011 and 2013. A growing interest has been experienced from potential clients driven mainly by market factors (growing energy prices) and consolidation of the financial crisis, but also via governmental promotion and programmes. ESCO projects have been focused primarily on public lighting and public buildings, with some attention on private non-residential buildings, and industries involving cogeneration, audits, HVAC control systems. The number of companies was estimated to be minimum 20.

Current ESCO market

There is no agreement about the number of ESCOs in Spain amongst local experts. The registry of IDAE (Instituto para la Diversificación y Ahorro de la Energía, the National Energy Agency¹¹²) contains around 800 companies, of which much fewer can actually offer various kinds of ESCO

¹¹² www.idae.es

El Saucejo: Induction-based Public Lighting



BEFORE

AFTER

Public lighting facilities in the municipality of El Saucejo (Spain) were in poor condition; with obsolete equipment, which resulted in high energy costs and bad lighting conditions in most areas of the village.

Under an ESCO project, all 1024 points of the public lighting system were renovated in 2012 with new induction lamps and high efficiency reflectors, resulting in energy saving of 70% of the baseline, cutting down the electrical consumption of 740.000 kWh to 218.000 kWh per year. Additional benefits include the significant improvement of lighting quality that meets European regulations, combined with environmental sustainability. Furthermore the ESCO project created local employment because a local installer and maintenance company were contracted for the implementation of the project. The ESCO contract is worth €1,050,000 and is concluded for 10 years. It includes energy management control system and maintenance of the installations.

Source: ANESE and Cactus Soluciones Energéticas (2013)

contracts, such as ESC, ESPC or EPC solutions. The most likely range of available companies is 20-60 (EC JRC 2012). The large interest in registration at IDAE indicates the expectations for a fast market growth in the close future, combined with the search for new market opportunities by a large number of companies that were heavily affected by the collapse of the construction sector (EC JRC 2012).

These companies have a diverse background, including IDAE (which appears as a public ESCO in some contracts), a major energy distributors (other distributors do not participate in the energy services market), about 15 small, local or national consultancies, equipment manufacturers, distributors, installers, etc., and a further few 10s of companies whose main profile is to provide renewable based heating (Rivas Puente and Puente 2011). About 60-70% of the market players are local or national, while the other 30-40% are sister companies of large international ESCO giants (EC JRC 2012). Most of the ESCOs have consolidated core activities, especially the large utilities, construction and maintenance companies. Small consultancies and installers have been looking for new market opportunities and thus have joined the group of energy service providers (EC JRC 2012).

The size of the ESCO market is estimated to be €400-500 million annually, calculating with all costs, i.e. energy supply costs, investments plus maintenance and considering all types of projects (EC JRC 2012). The investment potential estimates range between €1.5 and 6 billion including construction, installation, operation, maintenance, and monitoring and verification, as well as the supply of energy (EC JRC 2012).

There are several associations that represent ESCOs. AMI is the Association of Companies of Integral Maintenance and Energy Services¹¹³ and has 19 big member companies. In order to become a member, experience in ESCO projects has to be proven. ANESE is the National Association of ESCOs with 130 associated companies. The Association of Energy Efficiency Companies (A3E) was established in 2010 and represents 60 firms, consultants, ESCOs, auditors, and equipment manufacturers and distributors. Furthermore, there is an ESCO working group, made up of IDAE, regional energy agencies and the ESCO associations. The goal of the group is to boost the energy services market, raise awareness, and develop model contracts for public and private clients respectively. Also the Spanish Industry Minister (MINETUR) created a working group for the transposition of the Energy Efficiency Directive, in which the 3 above associations participate. The Spanish Minister of Development created a group of experts with AMI members in order to develop a new Strategy of Energy Efficiency Regeneration and Rehabilitation.

Types of projects

Most preferred target areas are public lighting (installing LED and new control systems) which represent about 90% of all public projects, public buildings (municipal offices and health care facilities), and water supply renovations in the public sector, and a military residential complex, hotels, corporate buildings, sports facilities, heating systems in apartment buildings, and big industries in the private sector.

Most contracts are based on energy and services supply contracts (almost exclusive in the public sector), the Public Private Cooperation Agreement, and leasing, renting or EPC (mainly in the private sectors) (IDAE 2011; EC JRC 2012). “Chauffage” was common before, but it is not possible any more in the current legal framework. In the last years more ESCO projects offer guarantees, such as EPC, and in most of the new public contracts the savings are shared with the local authority. The shared savings model is preferred to guaranteed savings (EC JRC 2012).

¹¹³ <http://www.amiasociacion.es/>

ESCO activity in the private sector is growing especially in the residential, hotel, commercial and office building sectors. The severe energy cost increase (electricity, natural gas and diesel) experienced in Spain during the last several years is fuelling more and more interest from private customers. In the private sector, the EPC contract model is preferred over other alternatives.

HVAC renovation and indoor lighting refurbishment, automation systems, pumps, motors and control systems, and relamping are common demand side technologies. On the supply side boilers, CHP and renewables have been done regularly, although from 2013 due to the elimination of subsidies to CHP and renewable energy production have caused a significant if not complete stop on installation of these supply options.

Regulatory factors

The regulatory background and public promotion of the ESCO market has been significantly improved in recent years. The definition of ESCO, an endorsement system, and the standard energy services contracts for the public sector have been incorporated into Spanish law in 2010 (Legislative Royal Decree 6/2010, Article 19) partially with the goal to revamp economic recovery and employment by encouraging public works through the ESCO solution (IDAE 2011; Boonekamp and Vethman 2010). This was expected to create a significant growth of the market (Marino et al. 2010), but has not been seen to date; creating a significant frustration within the ESCO industry (EC JRC 2012). Bottlenecks are yet to be found but speculation among the industry points towards the lack of true commitment for change within the public sector and poor political interest in energy efficiency (EC JRC 2012).

Public procurement rules are adapted to long term contracts (up to 20 years) since October 2007, when the new national procurement law (Law 30/2007, modified in Legislative Decree 3/2011) was approved. The contracting processes have been made more dynamic (IDAE 2011), and Article 11 of the Law defined the Public Private Collaboration Contract (PPCC) to suit best municipal conditions for ESCO projects (Rivas Puente and Puente 2011). Energy-efficiency criteria were developed to be considered in the tendering process (Boonekamp and Vethman 2010).

The general regulatory system for energy efficiency is similar to other countries (building codes, building labelling, and earlier renewable incentives that were stopped in 2013, etc.), but these have not been reported to significantly affect the ESCO market in particular. On the other hand, the Estrategia de Ahorro y Eficiencia Energética E4 (National Energy Efficiency strategy) was approved by the government in 2003 for the period 2004-2012, although it is expected to be changed by the Government soon. The sub-programme E4+ was running during the period 2008-2012 with a total public budget of €2.4 billion and covered a collection of demand side management measures in 6 sectors (buildings, industry, transport, agriculture, public services, and appliances). The E4+ programme subsidized 75% of energy audits costs, and the measures proposed in the energy audit report could be eligible to receive additional subsidies (a maximum of 22%) for their implementation if they fulfil certain conditions (Marino et al. 2010; Rivas Puente and Puente 2011).

Two targeted governmental programmes were planned to promote energy services, but they were discarded by now as a result of the EUROSTAT accounting rules of ESCO services as part of the national deficit. The “Energy Efficiency Activation Plan for the State’s General Administration Buildings through ESCOs”, also referred to as the 330 ESE Plan, was adopted by the Cabinet in December 2009 (EC JRC 2012; Rivas Puente and Puente 2011). The Plan aimed at reducing energy consumption by 20% in 330 public buildings owned by the central government by 2016. The involved buildings were obliged to have an energy manager and that the energy efficient service should be outsourced to an ESCO through an

EPC (Concerted Action ESD 2012; Rivas Puente and Puente 2011). However, as said above, the plan was stopped after the renovation of 1 building and 5 in the pipeline.

The “Plan 2000 ESE” was adopted in July 2010, to achieve energy savings in further 2000 public buildings (Rivas Puente and Puente 2011; Concerted Action ESD 2012). This plan has experienced similar problems with implementation and therefore its impact has been so far almost zero (EC JRC 2012).

The frustration generated by the fiasco of these two programmes is considerable. The industry was expecting a boom of projects as a consequence of these programmes and other very positive changes in the legal and financial frameworks, and all preparations were in vain. A full exploration of the exact reasons of the problems and final call-down would be particularly recommended in order to overcome similar situations in the future and to liaise with the industry to move forward successfully in spite of the lack of these programmes (EC JRC 2012).

Later the “Plan for the intensification of saving and energy efficiency” was adopted in 2011 (de Julián Rodríguez 2011) to further intensify actions.

Market factors

The ESCO business does not work on a pure market basis yet in Spain. In recent years, several market factors have changed that were able to raise attention on energy efficiency, including rising energy prices and a slow recovery of the construction and the financial sectors, which were heavy hit in Spain during the financial crisis. It is believed that these autonomous factors were more important in the growth of the ESCO market than dedicated legal and regulatory changes, but at least could successfully contribute to those effects (EC JRC 2012).

Awareness and trust

Model contracts (known as the 4 P’s model) adapted for the ESCO projects are available from the IDAE webpage¹¹⁴. These were developed with the collaboration of AMI, therefore the ESCO stakeholders have been involved. Furthermore, there are Official Recommendations of the Spanish Finance Ministry, that can be used in the conclusion of Public-Private Cooperation Agreements, energy and services supply contracts, in order to help both the clients and the ESCOs.

ESCO promotion is relatively active in Spain. The associations as well as the government agencies and IDAE have had a number of supportive awareness raising programmes, some of them particularly targeted at EPC and TPF. In 2010 a new association, the National Association of Energy Services Companies (ANESE) was established (Boonekamp and Vethman 2010). IDAE provides various training courses, in particular the energy trainings for local and regional municipalities educate potential clients for ESCO procurement. Seminars are also organised by market players, companies.

Nevertheless, experts identified the lack of information as one of the key areas to be corrected. The ESCO model starts to be well known within the energy efficiency industry, but is not understood at the customer level. A lot of customers link the ESCO model with budget cuts, hidden privatization, drop on service and comfort levels, demotions, etc.

¹¹⁴ <http://www.minhap.gob.es/es-ES/Servicios/Contratacion/Junta%20Consultiva%20de%20Contratacion%20Administrativa/Informes/Paginas/32-%20Recomendaciones%20Acuerdos%20y%20Circulares.aspx>

Financing ESCO projects

ESCO projects are very diverse when it comes to the financing modalities, and all types of typical ESCO project financing can be found in Spain, namely customer financing, ESCO financing and TPF (EC JRC 2012). It is possible to involve market based bank loans, which may be aided by the governmental financial incentives. Financing is available from public and private institutions for specific energy service projects. These institutions include, among others, energy agencies like IDAE and regional agencies (e.g. ICAEN, EVE, AVEN, etc.) and private companies like the ESCOs themselves.

The ICO-ESCO Line was designed to boost the ESCO market and ran between 2010 and 2011 (Concerted Action ESD 2012). It consisted of a credit line managed by IDAE, of €600 million from the Sustainable Investment line (de Julián Rodríguez 2011). The eligible projects were not restricted to traditional ESCO sectors, but instead it was possible to apply with projects – for example – in the transport sector, or with biogas. The mechanism of the fund reduced the level of guarantees required by banks in TPF projects (Concerted Action ESD 2012). The assistance was divided as follows (IDAE 2011):

- 1) An economic aid line aimed at energy consumer sectors for the contracting of technical assistance in diagnostics, energy audits and for the preparation of the contracts;
- 2) An economic aid line in the form of a bonus or compensation aimed at the finalist ESCOs involved in competitive dialogue;
- 3) An economic aid line aimed at the ESCOs with awarded contracts, for the realisation of investments.

Unfortunately, the mechanism together with the associated programmes saw limited success and was cancelled in 2011.

A Preferential Credit Line provides financial incentives for energy efficiency strategic projects carried out in the industrial sector with TPF (Boonekamp and Vethman 2010).

In May 2013, the F.I.D.A.E. Fund was launched by IDAE, with almost €123 million from the JESSICA Fund, in order to finance sustainable urban projects of energy efficiency developed by ESCOs. The programme was meant to follow-up the ICO-ESCO programme. The Fund is co-financed by FEDER and IDAE and it is operated by the EIB through the Spanish BBVA Bank. In order for a project to be considered for funding it must be planned to be realized in one of the 10 regions included in the FIDAE, it must cover measures in buildings, industry, transport or the public infrastructure related to energy efficiency in the following fields:

- Building renovations (heating, cooling, lighting or thermal envelope)
- New buildings with Energy Label A or B.
- Renewal or extension of district heating and cooling.

The success of FIDAE is not yet seen either. As of October 2013 only 1% of its budget has been allocated to projects (EC JRC 2012)

Barriers

In spite of a number of positive change and factors, such as the adaptation of the procurement law, existence of the ESCO definition, standard contracts, active promotion and information dissemination and trainings, the nature of bottlenecks is not obvious. The industry was expecting a boom of the

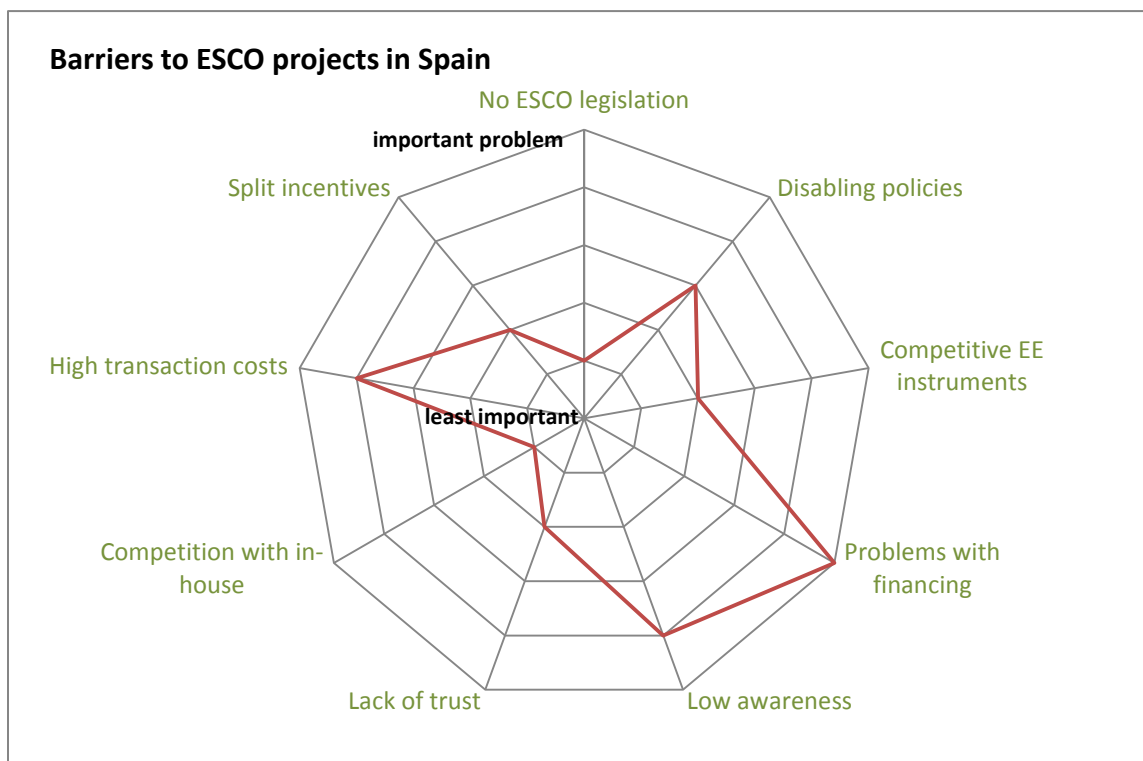
market as a result of the recent changes, however it has not yet happened. There is speculation about the need for real commitment at the political level to energy efficiency (which seems to be rather illusory at the moment), a need for marketing push to explain and promote the new ESCO legal framework at the municipal level, to overcome current confusion and misunderstandings; that eventually cause that many potential projects are blocked. There is an evident need for more training effort to explain the ESCO model to customers, in particular to key municipal players (municipal secretaries and controllers).

In spite of the existence of a number of credit lines and funds, the availability of appropriate forms of financing seems to be the most crucial obstacle to energy efficiency improvement (EC JRC 2012). The governments have not successfully combined the regulatory and promotional actions with economic or fiscal incentives. On the other hand, potential clients (SMEs, municipalities) suffer from low liquidity and thus low credit classification (Rivas Puente and Puente 2011), therefore are not able to enjoy the financial incentives.

While large efforts are seen to adapt the regulation in order to comfort ESCO solutions, too, the recent and regular changes, short-lived programmes cause instability and lack of trust. The advantages and the general concept of energy services are little understood amongst potential clients, in spite of the active efforts to organize seminars and awareness raising.

Administration is rigid and energy performance investments are difficult to process administratively (Rivas Puente and Puente 2011), therefore demand for ESCO projects. There are still regulations that appear to be an obstacle to EPC, e.g. amortization rules. Standard M&V protocol is missing (causing risks for EPC) (Boonekamp and Vethman 2010).

In summary, the following graph illustrates the relative importance of barriers in Spain:



Conclusions and future expectations

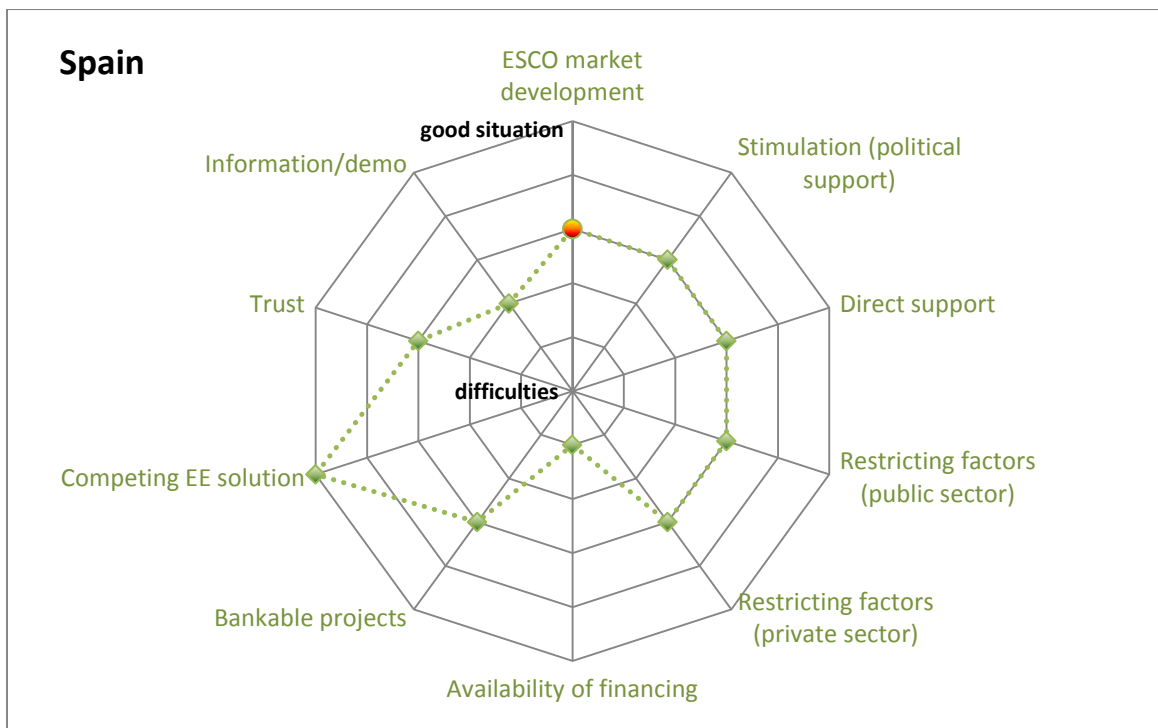
There is a well-established legislative background combined with promotional programmes, institutional framework and even financial credit lines, still the expected success of the ESCO solution even in the directly targeted areas (governmental buildings, public buildings) falls much behind expectations. The key barriers are not clearly identified, although there are speculations about the reasons of the lack of an ESCO boom in spite of the positive changes in many areas in the recent years. The fiasco in relation to two large national programmes that were to refurbish 330 and around 2000 buildings using only ESCO models shook the confidence in the support for ESCOs in Spain. Experts claim that the commitment to energy efficiency at the national level is only visionary. The programmes were stopped because of the fear that ESCo projects would be accounted as part of the national deficit by EUROSTAT. Although the industry tried to find a solution and to convince the government to keep the programmes running, only a few buildings were finally involved and renovated.

The framework of the Spanish ESCO market is complex. A lot of effort has been devoted to upscale this business sector, however seemingly with limited success. On the other hand, autonomous changes, such as energy price increase, restart of the construction sector, increasing interest from potential clients have contributed to a decent growth rate.

Key drivers

- adaptation of public procurement law and procedures;
- incorporation of the ESCO definition, procedures into national legislation;
- credit lines and other financial support mechanisms;
- active promotion and awareness raising;
- facilitators that promote, inform and represent the stakeholders;
- growing energy prices.

The following graph shows the key features of the Spanish market:



Spain in a snap-shot:

Number of ESCOs	20-60 (even though around 800 companies are registered in the IDAE registry)
ESCO market size and potential	<i>market size: €500 million/year</i> <i>market potential: over €5000 million/year</i>
ESCO market trend	strong growth in the public and the private sectors (except for the government)
ESCO association	AMI, ANESE, A3E
Typical ESCO projects	industry, public lighting and some private tertiary projects are the most common. Public buildings have the potential to be very attractive, but the large national programmes that were expected to drive these projects have not been started technologies: cogeneration, audits, HVAC control systems, indoor and public lighting
Main type of contract	Public-Private Cooperation Agreement, energy and services supply contracts, chauffage, and leasing EPC (guaranteed savings) is growing

Swedish ESCO market 2013

The Swedish ESCO market was described previously as advanced and as an exemplary model of rapid market development. Market boom around 2004-2005 was due to a complex package of success factors including successful promotion, channelled policy strategy, and increasing public concern for climate change ((Forsberg, Lopes, and Öfverholm 2007; Gottberg, Axelsson, and Gode 2009; Bertoldi, Boza-Kiss, and Rezessy 2007), and a parallel development of information and communication technology (Stenqvist and Nilsson 2009a). Around 2000 there was practically no ESCO activity in Sweden after two upsurges in the 1980s and the early 1990s that proved to be unsuccessful in establishing the ESCO concept on the long run. Lack of trust¹¹⁵ set back the entrance of ESCOs into the energy efficiency market even in times when energy services thrived in some other European countries, as long as until ca. 10 years ago, when strong development occurred driven primarily by a strong demand from the public sector (Wargert 2011). From 2009 growth has been more modest.

Current ESCO market

In 2010, the number of firms that were engaged with the ESCO business was put at 5-10 (Marino et al. 2010), though others spoke about 27 ESCO-type companies¹¹⁶ (Stenqvist and Nilsson 2009a). A handful of these could provide energy performance contracts or other guarantee-based “advanced” ESCO services (e.g. “function agreements” or “comfort agreements”) (Energimyndigheten 2011). Today, experts estimate that there are 6 active EPC firms (EC JRC 2012). Companies are mostly building and control manufacturers, which operate ESCO services as supplementary to other business activities. Lately additional energy supply companies started to create energy efficiency services units, thus

¹¹⁵ Problems originated from the difficulties related to proving the success (or failure) of ESCO projects, because data collection was difficult then. It was much harder to establish baselines and to follow savings related to the services than in 2005-2006 (Forsberg, Lopes, and Öfverholm 2007).

¹¹⁶ 9 local/national companies, 18 international firms

entering the ESCO market (EC JRC 2012). A few consulting firms occupy a niche in supporting EPC customers with consultancy services related to procurement and project implementation (Stenqvist and Nilsson 2009a). There are around 5-10 EPC projects per year from 2009.

Market size was estimated at €60-80 million in 2010 (Marino et al. 2010). A similar estimate is not available currently, though current market size is thought to be in the same range or slightly bigger (EC JRC 2012). This moderate expansion¹¹⁷ is the result of growing energy prices and more stringent energy performance requirements (EC JRC 2012). Experts calculated the investment potential of the ESCO market as €300 million annually, when considering maximum 5 years payback periods¹¹⁸ and taking into account the construction costs, but not the energy supply costs (EC JRC 2012).

The association “EnergiEffektiviseringsFöretagen” (EEF, Energy Efficiency Companies)¹¹⁹ is a platform of companies that profile themselves as suppliers of the most energy efficient products and services, and therefore also represents many ESCOs. EEF was established in 2006 as a branch of the Association of Energy Advisors Sweden and became an independent association in 2009. Furthermore, consultants, universities, research organisations, the national energy authority (Swedish Energy Agency, SEA¹²⁰), and the ESCOs themselves promote and facilitate market development, including the organization of trainings, workshops, and seminars, as well as the implementation and promotion of demonstration projects. The “Forum for Energy Services” used to act as some form of association, but it has been inactive in the recent period.

Types of projects

The primary target of ESCO projects is municipal buildings, such as schools, hospitals, administrative buildings, while private sector clients are less common, but existent amongst hotels, retail estates, office buildings, even residential buildings¹²¹ (EC JRC 2012). ESCO projects typically include the renovation of complex building systems, lighting, envelope, HVAC, operation and education, etc. For a few years even construction and installation have become part of energy services. As of 2011 almost 15 million m² of building floor was covered by EPC projects, which is over 15% of the total public sector floor area (Energimyndigheten 2011; Nilsson, Stenqvist, and Lindgren 2010; Wargert 2011).

Sweden has a building stock where ca. 50% of all buildings, 82% of residential apartments and 68% for office space, commercial premises and public buildings are supplied with district heating (Energimyndigheten 2010). This provides a strong basis for Energy Performance Contracts, while Energy Supply Contracting (ESC) is less common. The latter is more popular in industrial projects (Wargert 2011). As for EPC, guaranteed savings model has been widespread in the Swedish market, because

¹¹⁷ Some experts even suggest that the market has been decreasing in the last 1-2 years.

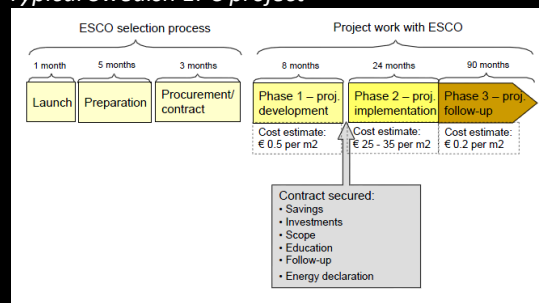
¹¹⁸ Given that ESCO projects usually have a payback time longer than 5 years, the estimate is an underestimate.

¹¹⁹ www.eef.se

¹²⁰ <http://www.energimyndigheten.se/en/>

¹²¹ usually those owned by municipalities (EC JRC 2012)

Typical Swedish EPC project



The above graph shows the timing and costs of typical municipal projects in Sweden.

Source: Stenqvist and Nilsson 2010

public sector clients have good lending status and can get more beneficial financing on their own than any ESCO can provide (Wargert 2011).

Besides EPC, the “chauffage” model (may be referred to as “comfort contracting” in Sweden) occupies a growing business segment, mainly used by municipal energy companies (Wargert 2011). The services usually include outsourcing of the service and maintenance organization. The outsourcing service is a growing trend and a driver for the model. The growing use of chauffage brings competition to other business models.

Customers are opening to facility management, too, and are interested in the combination of these with EPC services (Wargert 2011). However, many providers are new and inexperienced, which has resulted in projects with disappointed customers, therefore the model is expected to be changed and adapted to the needs. Nevertheless, it is expected that this combined model will be growing in the future.

Regulatory factors

The success of the complex and locally tailored policy strategy in reviving the Swedish ESCO market attracted international attention (Marino et al. 2010; Bertoldi, Boza-Kiss, and Rezessy 2007). The key features of this strategy were a combination of EU-driven policies and locally tailored ones, including energy certificates for buildings, a subsidy scheme for public buildings (KLIMP)¹²² and OffROT¹²³, and market instrument such as CO₂ taxes, green certificates, electricity tax for energy intensive companies, etc., which together significantly increase the profitability of energy efficiency measures, thus the market for EPC (Marino et al. 2010). Voluntary agreements (Programme for improving energy efficiency in energy-intensive industries (VA PFE)¹²⁴) stimulate energy audits and energy efficiency improvements in return to tax relief on electricity tax (Stenqvist and Nilsson 2009b). Information and capacity building campaigns and subsidy programmes (see below) added to the effects of regulatory measures (Forsberg, Lopes, and Öfverholm 2007). These measures proved to be complementary and have synergistic effects, therefore form the building blocks of successful policy packages (Boza-Kiss, Moles-Grueso, and Urge-Vorsatz 2013).

Sweden is particular in that its public procurement act (came into force in 2008) is supportive of and able to accommodate the procurement of EPC. Some experts judge the practices as too complicated. Still the success of municipal ESCO projects indicates that in general, ESCO procurement is possible and seem to be easier than in other countries. The main problem is that a full feasibility study can be done by the winner of the tender only and therefore there is no true competition of the offers for the actual and final services. Procurement guidelines for EPC were issued by the Swedish Environmental Management Council in June 2009 (Gottberg, Axelsson, and Gode 2009), in addition to procurement models produced by the Swedish Energy Agency, although these are not widely used (EC JRC 2012).

The National Energy Efficiency Action Plan of Sweden (Government of Sweden 2011) pledged to the promotion of energy services (EPC) in the housing and service sectors, however details about actual measures are unknown.

¹²² KLIMP was closed in 2008. This programme provided municipalities and other local actors with grants up to 30% of the investment for long-term investments that mitigate greenhouse gas emissions.

¹²³ a €200 million investment subsidy program between 2005-2009 for EE action targeted at the public non-residential sector (Stenqvist and Nilsson 2009a)

¹²⁴ The programme will wind down until 2017 because it is considered a breach of regulations on state subsidies for industry. Thus no new entrants are allowed since 2012.

Market factors

While well-designed policy packages have been crucial in the development of the ESCO market in Sweden, the market and social environmental changes coincided with these to back up the development of the ESCO market.

The growth of the Swedish ESCO market is scrambling because it is difficult to penetrate the market by new entrants (EC JRC 2012). The Swedish market continues to be fruitful after the drying up of national subsidy programmes (KLIMP and OffROT).

Awareness and trust

The Swedish market, including the clients and the financing sector has been growing in knowledge and confidence constantly, and has become quite mature by now. While information dissemination continues, including trainings to major players, all parties of an EPC contract are largely aware of the benefits and challenges of ESCO projects and pursue their benefits. According to Wargert (2011), procurement process is becoming more standardized due to the increased maturity. However, several obstacles still persist on the market. In part these obstacles stem from the fact that the market is only developing and therefore practices have not yet become universal (SEA 2012).

End-users are made aware of the energy performance of their properties by consultancies, audits and awareness raising activities (Gottberg, Axelsson, and Gode 2009).

Financing ESCO projects

Financing ESCO projects is not the most crucial problem as opposed to many other markets, though some municipalities may face difficulties due to tight budgets. Usually, clients (public clients and industry) can either finance projects from their own budgets or can easily arrange for commercial loans. Given that the ESCO formula is well-accepted in the public sector and by the financial institutions, and the awareness is rather high, procurement is not problematic from this point of view (Gottberg, Axelsson, and Gode 2009).

Previously national grant programs, such as KLIMP and OffROT were also available, but these have not continued recently, and it seems that the ESCO market is able to work on purely market-basis. The government pledged to provide financial support to projects in the less advanced sectors, e.g. in private housing, according to the Swedish NEEAPs (Government of Sweden 2011).

Barriers

As seen above, the Swedish ESCO market has been on a growing phase for about 10 years, although with only a moderate growth since 2009. Nevertheless, there are a number of barriers that continue to exist, particularly related to the difficulty of new entries into the market.

The halt in 2009 is due to an EPC procurement in Stockholm, where disagreement between the parties could not be dissolved. The effects of this dispute were negative on other companies, too and created mistrust in the EPC business model (Energimyndigheten 2011), market recovery is slow since then.

There is a significant gap between the supply and the demand side of energy services, because the number of projects per year is too few in respect the number of suppliers in this field. The most important changes to pursue include:

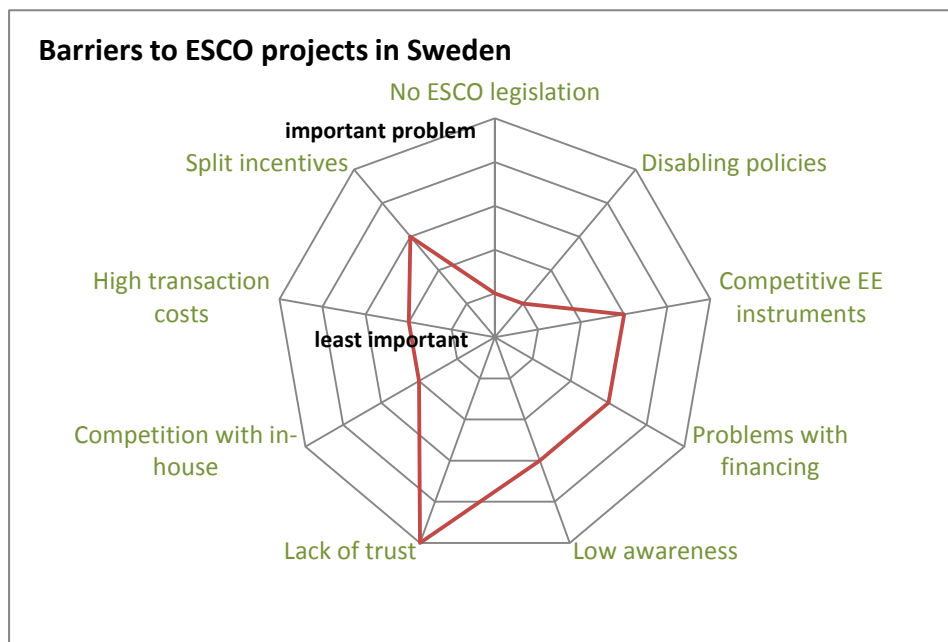
- Competence: there is a need to further educate customers about the concept;
- A broad range of energy services should be developed that meet better the more flexible needs of the customers;
- Clear and accepted accounting rules need to be accepted, disseminated and applied;
- Confidence between actors will have to be developed.

In addition, currently the time of ownership is too erratic, which increases the ESCO's risk associated with relatively longer term projects (up to 10 years is typical in Sweden).

Barriers to competition include the still unresolved question whether municipality-owned energy companies are allowed to compete in energy services outside their municipality of origin or not. Today, practice varies with some companies that are allowed to operate throughout the territory of Sweden while others restrict their activities to one municipality (SEA 2012).

Experts have expressed, that university curricula should be strengthened to make more educated knowledge available. General awareness raising should be continued. While ESCO projects are relatively well known and examples can be found in both the public and private sectors, there is still a significant potential to be tapped.

In summary, the following graph illustrates the relative importance of barriers in Sweden:



Conclusions and future expectations

The Swedish ESCO market experienced a boom a few years ago, which was taken as a good example in Europe. The rapid market growth was a result of the successful combination of economic and regulatory factors. However in 2009, the market halted due to an unsuccessful ESCO project. This has been

followed by slow recovery, and currently the growth of the ESCO market is limited or it is even on a down-turn.

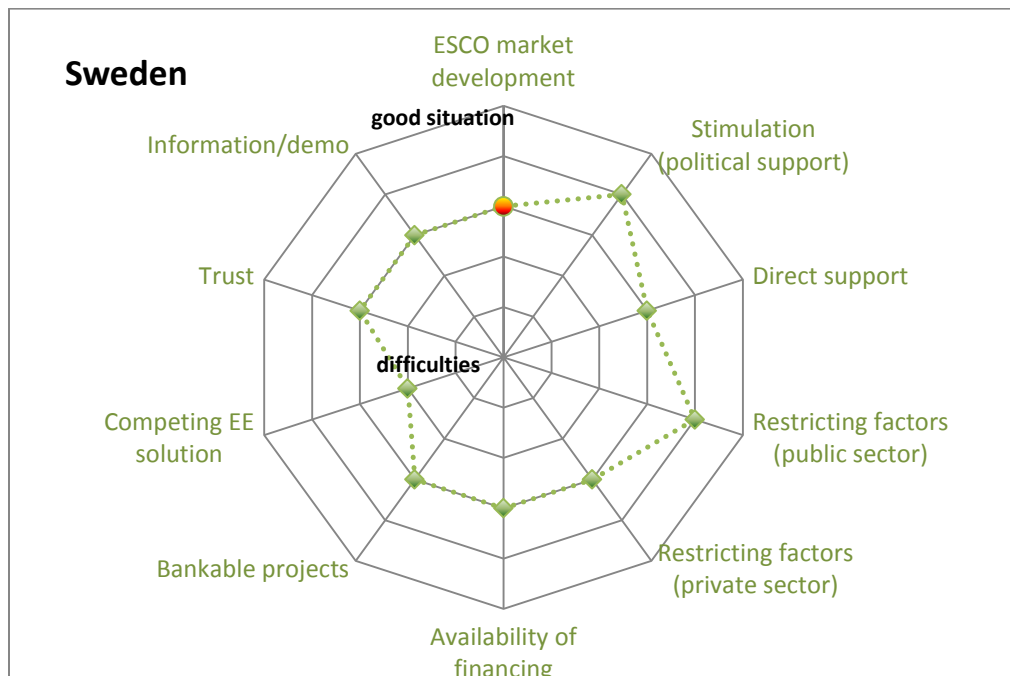
During the last years, a diversification of the target sectors is seen and variants of the contracts appeared. Besides economic and political motivations, the market is largely driven by needs other than energy efficiency improvement, for example by deferred maintenance and poor indoor air, the need for modernization and renovation of properties, etc. In the public sector, policy decisions and the willingness to contribute good example form the basis for the procurement of energy services. Public buildings have been engaged in EPC projects, because of the energy and savings requirements that are increasing in stringency. On the side of private clients, public image and corporate responsibility are important.

It is expected that the ESCO market will be able to grow beyond the public sector due to supportive policy framework and further increase of awareness (EC JRC 2012).

Key drivers

- climate concerns and public image, as well as showing good example;
- clear ESCO definition;
- facilitation of ESCO procurement;
- awareness and knowledge of financial and constructions sectors;
- growing mutual trust between clients and ESCOs (after a crush of this in 2009);
- investment support programs (though drying up), building certification, and information campaigns by a variety of actors.

The following graph shows the key features of the Swedish market:



Sweden in a snap-shot:

Number of ESCOs	6 companies that offer EPC
ESCO market size and potential	<i>market size: €60-80 million/year</i> <i>market potential: €300 million/year (investment potential considering maximum 5 years payback periods and taking into account construction costs, but not energy supply costs)</i>
ESCO market trend	slow growth (some suggest slow decrease)
ESCO association	Association EnergiEffektiviseringsFöretagen
Typical ESCO projects	public sector buildings primarily, but examples found in all sectors
Main type of contract	EPC with guaranteed savings in buildings, Energy Supply Contracting in industry Chauffage (referred to as comfort contracting) and facility management are gaining popularity

The UK ESCO market 2013

The energy services market in the UK is amongst the most mature ones with a relatively long history (Marino et al. 2010). The very first ESCO was Associated Heat Services (Dalkia today), a subsidiary of the National Coal Board, set up in 1966 (Fawkes 2007). The company offered to take over the management of the clients' boiler houses. The EPC market established itself by 1984, when subsidiaries of other large energy companies and engineering companies started to include value added services such as project financing to their traditional offers (Marino et al. 2010). During the 2000's a number of changes took place in the framework conditions that had an effect on the market (the demise of the CHP 2000-2004, electricity trading arrangements in 2002, climate change issues 2005 onwards, and rising electricity prices) (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2010).

The United Kingdom ESCO market has had a special character and as part of it, uses different terms from the rest of Europe. The expressions 'ESCO', 'TPF', 'EPC' were largely unknown until the European Directives, such as the Energy Services Directive and the Energy Efficiency Directive did not insert more influence. The more well-known denomination of energy services in the UK is Contract Energy Management (CEM)¹²⁵ (Bertoldi, Boza-Kiss, and Rezessy 2007). (EC JRC 2012).

¹²⁵ for definitions, please see the introduction of this report.

Current ESCO market

As of 2013, there are about 30-50 ESCO companies working on the UK market, which reflects a considerable increase from around 20 companies in 2009 when (EC JRC 2012; Marino et al. 2010). About a third or half of these offer contracts based on guaranteed savings, however the size of this group is not known¹²⁶. The growth is contributed to an increasing demand for energy awareness and thus energy services, combined with a pressure to reduce costs. These are further motivated by legal changes that on one hand require the reduction of the energy demand in all sectors, as well as reward actions with incentives.

The variability of the companies and the flexibility in the contracts indicate that the UK market is still in a development phase (Hannon, Foxon, and Gale 2013). The major players are still large international manufacturers of building automation & control systems, as well as energy service and supply companies. Facility management companies are also part of the more dominant part of the market. A growing number of construction and property companies, smaller consultancies and dedicated ESCO firms started to populate the market in recent years (EC JRC 2012). These are mostly UK-owned. From another perspective, it is interesting that companies that are able to offer complex energy services almost dominate the building-related supply market with representing almost 30% of all companies in this area (EEVS 2013). A recent trend is the entrance of utility companies into the energy services business. Major UK energy suppliers believe that while their business is in selling more units of energy, they can add value to their services and differentiate themselves from competitors and therefore keep their clients (or attract new ones) if they respond to the overall new emerging demand of quality services and energy cost savings (Hannon, Foxon, and Gale 2013).

Even municipalities have entered the energy services market in recent years (Hannon, Foxon, and Gale 2013), and others have formed partnerships amongst private, public and third sector organizations to develop joint ventures. These are meant to provide a higher quality service, occasionally with additional social benefits. This influx continues to occur (Hannon, Foxon, and Gale 2013).

There are interesting examples of community ESCOs, e.g. the Meadows Ozone Energy Services Limited (MOZES)¹²⁷. MOZES replaces the traditional energy suppliers in the region of Nottingham. The MOZES

Bundling small buildings to create successful EPC



The London Borough of Harrow engaged 6 schools in its first RE:FIT project, which is based on contracting an ESCO through an EPC for the renovation of a combination of a set of similar buildings to ensure a higher viability and to reduce transaction costs through the bundling. The measures included boiler replacement, lighting upgrades and controls, heating controls optimisation, voltage optimisation, roof insulation, loft insulation, and draft proofing.

Savings: 29% guaranteed cost savings per annum, equaling 345 tCO₂/year

Investment need: Over £586 000 capital investment

Payback period: 10 years

Timescale: Installation started February 2012, completed December 2012

Source: Kingston and Hordle (2012)

¹²⁶ The FRESH project found 17 ESCOs that could offer EPC in 2010 (Andrews and Hofman 2010).

¹²⁷ <http://www.mozes.co.uk/>

ESCO is responsible for financing, installing, operating and maintaining PV systems that supply the residents – who own the company – with renewable electricity via energy supply contracts. They reinvest the profits from these supply contracts in additional measures capable of alleviating fuel poverty in the area, reducing the community's carbon footprint and developing the local area into a space for sustainable energy technology innovation (Hannon, Foxon, and Gale 2013).

The market volume has not been estimated by experts recently, and the market potential is put at around €1 billion for the non-domestic sector, which has not changed since 2010 (EC JRC 2012; Marino et al. 2010)

There are various trade associations in the UK, some of which incorporate ESCOs. The Energy Services and Technology Association (ESTA)¹²⁸ is probably the most known ESCO representative, which collects companies on the demand side energy efficiency of buildings, building services and process services, thus including ESCOs. ESTA features about 120 members as of 2013¹²⁹. ESTA has established the 'Contract Energy Management Group' that specializes on the ESCO market and consists of the 14 key ESCO stakeholders.

The Energy Managers Association (EMA) is also active in helping to cultivate a growing ESCO market. It represents individuals and companies of energy managers, provides trainings and conferences, raises awareness and knowledge and develops guidelines¹³⁰.

Types of projects

Currently, the ESCO/EPC contract is very flexible and fluid, which indicates that maturity is not yet achieved and the contracts are done on a case by case basis (Hannon, Foxon, and Gale 2013). Thus contracts are tailored to the specific cases and clients.

Nevertheless, Contract Energy Management (CEM) remains to dominate the energy service contracting market. This is the traditional UK-version of heat supply contracts. At the same time, the volume of guaranteed savings models grows, both in the form of shared savings and guaranteed savings contracts (EC JRC 2012).

EPC is getting more attention due to promotional programmes and because with the increase of awareness clients also prefer guaranteed investments. Furthermore BOOT contracts also work well in the UK environment .

Most advanced sectors are public buildings, educational and healthcare facilities, social housing, and some private tertiary buildings in the retail and offices buildings. Industrial clients, which used to be the most common clients, continue their involvement, too (EC JRC 2012).

HVAC, public lighting, energy conversion and supply technologies are profitable due to the decrease in their prices recently. Indoor lighting has attracted much attention with the spread of LED, as this intervention offers large savings that are easy to guarantee (Hannon, Foxon, and Gale 2013). On the other hand, some measures are still considered too expensive to be cost-effective for ESCOs, such as external wall insulation, which is often used to improve the energy efficiency of properties without wall

¹²⁸ <http://www.esta.org.uk/>

¹²⁹ http://www.esta.org.uk/MAIN_MENU/MEMBER_LIST/index.php?s=75&np=2

¹³⁰ <http://www.theema.org.uk/>

or loft cavities. Since the improvement of heating infrastructure, district heating and cooling offer large savings, it is expected that social housing projects can be focused on this axis (Andrews and Hofman 2010)

Regulatory factors

Specific regulation on ESCOs and EPC is non-existent, which provides space for market influenced, tailored and fluid contracts and projects. In the lack of regulation and targeted incentives, the business model is constantly changing, the market is experimenting (Hannon, Foxon, and Gale 2013). There are however initiatives to prompt a more standardized system, at least in certain areas. The RE:FIT programme¹³¹ is part of a family of renovation programs that has significantly improved the prospects of EPC through introducing and testing standardized energy savings contracts for bundled municipal and private buildings.

On the other hand, the UK has a very strong climate and energy conservation policy system in place, including stringent targets. New ESCO entrants and in particular utilities see it reasonable to engage in the field of energy savings as they see a serious commitment to a transition to a low-carbon economy from the state. This encourages skill development and financial commitments (Hannon, Foxon, and Gale 2013).

ESCOs benefit greatly from the general push for sustainable use and production of energy. These measures include financial incentives (for example, Feed-in Tariffs (FiT), Renewable Heat Incentive), capital grant schemes (e.g. Local Energy Assessment Fund), finance schemes (e.g. the Green Deal, Salix¹³²) and low-carbon obligations (e.g. Low-Carbon Building Regulations, CRC Energy Efficiency Scheme, CERT) (Hannon, Foxon, and Gale 2013). While recently, ESCOs have been quoted only in a superficial level in white papers as an appropriate solution, the ESCO concept does get some, though limited attention under the Green Deal and the associated Energy Company Obligation (ECO) for financing energy efficiency improvements (Hannon, Foxon, and Gale 2013; EC JRC 2012).

One of the most important regulatory changes in relation to ESCOs has been the replacement of many of the capital grant schemes (e.g. Low Carbon Buildings Programme) with financial incentives (e.g. FiT). Earlier consumers/organisations were able to access capital grant funding to implement energy measures, but with their closure now, they search other means of covering the costs, thus turning towards ESCOs, too. (Hannon, Foxon, and Gale 2013).

There have been other changes for the advantage of ESCOs (and as a result of ESCO lobbying). The so-called “28 day rule” was axed. This rule allowed the clients to change suppliers 4 weeks after they established a contract with one. This made ESCO business very risky, and was changed in 2007. In 2010, local authorities’ involvement in the energy market was also lightened, making it possible for them to offer more successful ESCO business models.

Market factors

There is a clear natural demand for energy savings driven by cost and environmental motivations. In the case of companies interest in ESCO models is also inspired by the desire to improve the public image (EC

¹³¹ see more at: <http://www.refit.org.uk/what-refit/background/>

¹³² Salix is a not for profit, independent social enterprise that provides funding to public sector organisations, via loans and grants are GHG emissions.

JRC 2012). Industrial and municipal projects are largely driven by cost-reduction intentions (EC JRC 2012). The ESCO model has also offered customers to take better chances in participating in energy generation (Hannon, Foxon, and Gale 2013).

Awareness and trust

Lack of information and especially the existence of confusion about the concept and the varying contracts, the large flexibility in the systems, the ESCO companies themselves and the possible interventions make it difficult for the clients to place their votes for an ESCO project. Associations are active in developing trainings, guidelines and often help desks. There are a number of successful public demonstration project that are combined with extensive experience sharing and information dissemination.

Lack of information and trust is most critical in the case of financial institutions (see below).

Financing ESCO projects

With a, the financial sector has increased interest lately in energy efficiency and in supporting ESCO projects (Hannon, Foxon, and Gale 2013).

Profitability of the ESCO projects increases when they can be combined with the ESCO offers (e.g. Green Deal) and because of increased market competition (EC JRC 2012). However, national grants have been declining and/or changing, and ESCOs would need to identify alternative opportunities. The emerging option could be a higher share of TPF in partnership with commercial banks. These are today more open to EPC project financing than before, because a stable climate-oriented political commitment and the related regulatory framework decreases regulatory risks (EC JRC 2012).

A public bank has been opened. The Green Investment Bank has £3billion to invest in energy efficiency and renewable. It has been suggested by experts that this source could be an important kick for the ESCOs (EC JRC 2012). The Green Deal Finance company provides financial solutions to support Green Deal projects, many of which are EPCs.

Barriers

In spite of the positive attitude from investors based on the clear track-record towards a climate friendly transition based on the enhanced and calculable policy framework, there are critiques, too. There are instances of unexpected changes, e.g. the reduction of the FiT by almost 50% in March 2012. Others complain about the low ambition of the implementing framework, as well as the current complexity of the regulatory system in this field (Hannon, Foxon, and Gale 2013).

Another regulatory barrier is the change in the Landlord & Tenant Act that questions the legitimacy of landlords in transferring the energy provision responsibility to a third party, i.e. an ESCO. The change also raises concerns whether an ESCO has the right to generate profit from its service, because the law would require the landlords to pass on a service like an ESCO-mediated improvement at cost price (Hannon, Foxon, and Gale 2013). The law's key problem is that these provisions are unclear (Andrews and Hofman 2010). There are severe restrictions on rents, which can only be increased 0.5% above inflation, with a cap on the increase of £2 per week (Andrews and Hofman 2010).

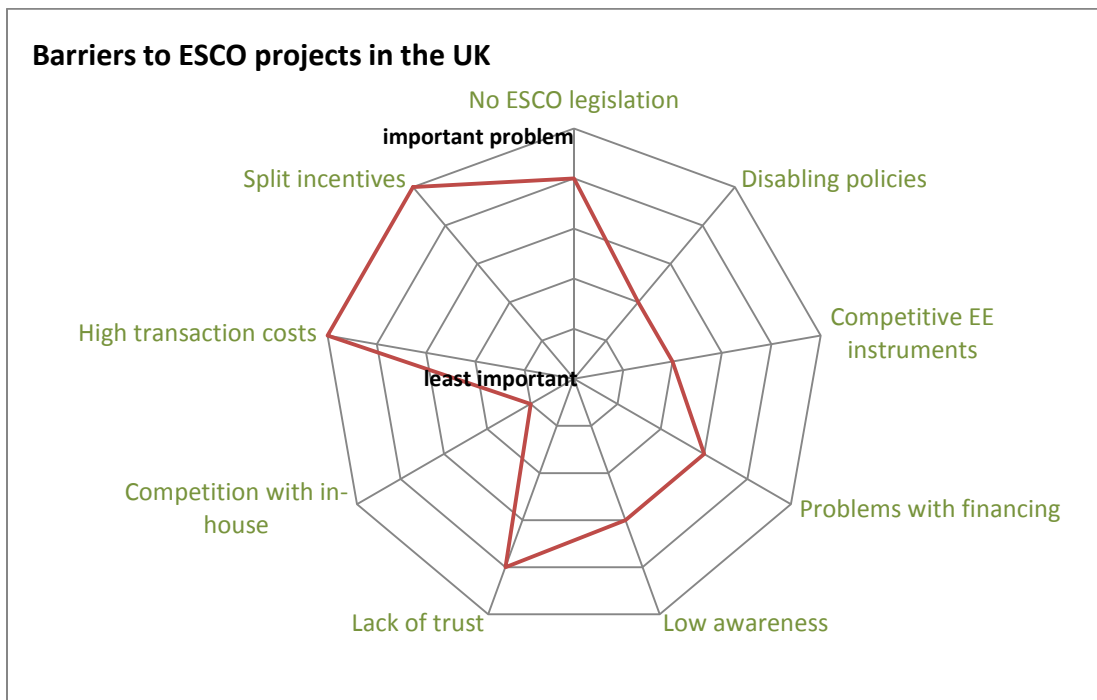
It has also been noted that by following EU Directives on public procurement, the process has become too complex and resource intensive, which appears as a major inhibiting factor for ESCO businesses (EC JRC 2012).

Financing opportunities of ESCO projects have improved in theory, because financial institutions see these projects less risky and to be associated with a higher profitability than before, however lack of trust in and clarity about the concept still orients investments towards traditional energy investments. If an EPC is financed, it is still treated as a normal debt, which makes it unattractive to customers (Hannon, Foxon, and Gale 2013). There needs to be significant awareness raising to be done especially for this sector.

Transaction costs are high in the UK due to the large variety of the contracts and the lack of standardization. Raising funds may also be resource intensive and the lack of awareness about the ESCO solution makes promotion difficult (EC JRC 2012; Harrison 2013).

Lack of information and trust should be addressed. This is done recently with a large number of demonstration activities.

In summary, the following graph illustrates the relative importance of barriers in the UK:



Conclusions and future expectations

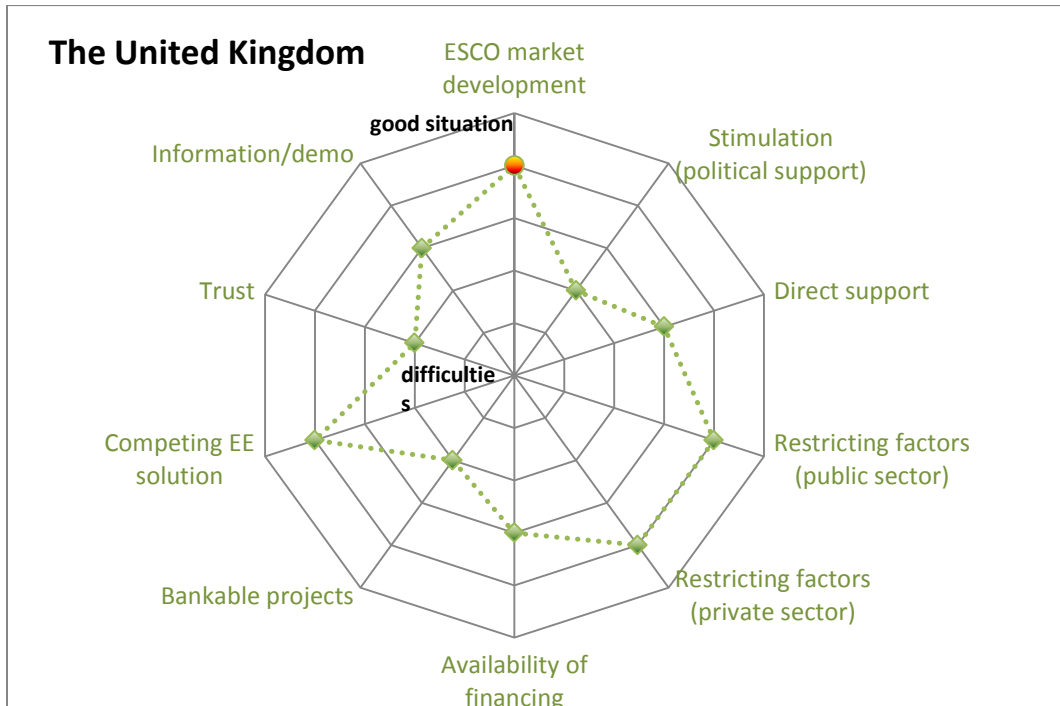
The UK ESCO market has taken leaps in development and can be expected to carry on with a strong development. The number and types of stakeholders have increased in recent years significantly. Nevertheless the ESCO market is still restricted to isolated projects, and there is no widescale use seen. The ESCO solution still remains a niche area. On the other hand, the ESCO business is largely driven by market factors, because the legal framework – while it is largely supportive – does not provide specific push for them. There are no standard contracts and the level of information dissemination is limited. It is expected that the volume of projects could proliferate as long as critical barriers are addressed

because the good examples could be built on and the increase of trust by clients and financial institutions can grow.

Key drivers

- Long-term and solid climate targets, political commitment;
- Flexibility of the contracts;
- Increased profitability;
- Increasing demand side interest.

The following graph shows the key features of the UK market:



The UK in a snap-shot:

Number of ESCOs	30-50
ESCO market size and potential	market size: unknown market potential: €1 billion
ESCO market trend	balanced growth
ESCO association	Various trade associations, e.g. ESTA, EMA
Typical ESCO projects	industrial sector, public buildings, hospitals, schools, offices, social housing supply side and networks (district heating), HVAC, control technologies, lighting and public lighting
Main type of contract	Contract Energy Management (CEM), BOOT EPC (both shared savings and guaranteed savings)

Other European countries

Norwegian ESCO market 2013

Starting from an embryonic status, the ESCOs market was shrinking further slowly between 2005 and 2010 in Norway. There were between 10-15 companies during the years 2005-2010, dropping to 3-5 by 2010 (Marino et al. 2010; Mørk 2009). Recently, a slight development has been seen, driven by the climate awareness of potential clients (mainly municipalities) and by active promotion carried out by the supply side. The market still remains to be immature and small, dominated only by a few major players (Mørk 2013; EC JRC 2012).

Current ESCO market

As of 2013, there are 5 active ESCOs that dominate the market, shown by their regular participation in tenders. A few more companies appear occasionally (Mørk 2013). The market is currently in a kick-off phase, moving from pilot projects towards market based solutions.

The market is quite volatile, there are regular new entrants, i.e. new companies that pick up energy service provision. However, many of these have little previous experience, no demonstrated successful models, and unsuccessful projects may undermine trust in the market (EC JRC 2012). Other entrants come from abroad, who face a challenge because of the lack of local knowledge.

The size of the market has not been estimated lately, according to the knowledge of the authors. In 2010, it was around €25 million.

There is no ESCO association in Norway, and at the moment ESCOs promote the solution on their own. Probably as the market slowly grows there will be a demand to form a more united supply side.

Types of projects

Following a number of pilot and demonstration projects, mainly resulting from European projects, the ESCO market was stagnating during the years 2005-2010, when 2-3 projects were initiated annually. On the other hand, the growth of the market in recent years is indicated by the increased number (5-8) of projects being started per year. As a consequence of many pilot and demonstration projects, a significant collection of experiences and knowledge has been collected.

Beyond pilot projects: Clarion Hotel & Congress Trondheim



The 400-room hotel is a new example on the Norwegian market that shows the economic viability of guarantee based energy performance contracting. The Hotel was originally designed as a Class C building in 2007, however Skanska redesigned it to be one of the first Class A buildings in Norway. Thus the energy demand was halved. A water-to-air heat pump that uses seawater for heating and cooling and an advanced central building management system were part of the upgrade measures. The silkscreen glass reflects solar energy, thus reducing cooling needs. Furthermore, occupancy sensors and energy efficient lighting have been installed, as well as efficient elevators.

Savings: 3,000,000 kWh/year

Additional investment need: ca. \$ 3.6 million

Payback period: 5-6 years, combined with the use of a \$ 600,000 grant from ENOVA

Timescale: 2 years contract

Source: Morrin (2012)

Before 2008, most projects were developed in the industrial sector (Marino et al. 2010), but the focus has moved to the public sector since then. The investment values of municipal projects revolve under €5 million per project (Mørk 2013). ESCO projects attract many small municipalities, and an economies of scale may not be reached. As of May 2013, 25 out of the existing 428 municipalities have chosen to use EPC, which is a popular contract type (EC JRC 2012). The energy saving potential of municipal projects have been estimated to be around 30% in average (Mørk 2009), which is proven by the experiences of recent municipal projects (EC JRC 2012).

The housing sector has not been involved in ESCO projects yet, however the currently running ESPARR-project (Energy Savings from Regulation to Realization)¹³³ will pilot an EPC renovation in cooperation with a housing association (EC JRC 2012).

Regulatory factors

The direct regulation of the ESCO market or EPC is missing, however projects are often drawn up “simply” based on climate awareness and because most municipalities have joined one or few climate groups and have developed Climate Plans.

A key regulatory ESCO support is represented by the EPC standard that is in its final stages for adoption. The official standard is expected to boost the knowledge about EPC, as well as to remove a number of barriers related to trust, public procurement and “outsourcing” (EC JRC 2012; Mørk 2013). The standard follows the findings of European projects, in particular of Eurocontract¹³⁴ and EESI¹³⁵, with further inputs from local stakeholders, the National Energy Agency, and the Norwegian Association of Local and Regional Authorities (KS).

Implementing the Buildings Directive (EPBD, 2010/31/EU) is expected to further enhance municipalities interest in energy services.

Market factors

Recent years can be characterised by an increased interest both from building owners and ESCOs (Mørk 2013). While publicly supported projects dominated a few years ago, in the form of pilot projects, today municipalities’ interests drive the market.

Low energy prices and the excess volume of installed hydro-power mean significant hurdles towards energy savings (Mørk 2013).

Awareness and trust

While almost unknown a few years ago, the ESCO solution has been gaining more and more attention lately, from both the demand and supply sides (Mørk 2013). Promotional activity has been and is still limited. Awareness raising and communication with potential clients is based on the existing ESCOs’ own

¹³³ This is a national project in order to develop knowledge on dimensions and factors of importance for understanding energy use that will help policy makers in forming effective policies for energy savings. Selected promising policy instruments, such as Energy Performance Contracts (EPC) and Automatic Metering Systems (AMS) will be tested during the ESPARR project. The project is financed by the Norwegian Research Council. See more information at: <http://www.cicero.uio.no/projects/detail.aspx?id=30546&lang=EN>

¹³⁴ http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1576

¹³⁵ <http://www.european-energy-service-initiative.net/>

initiatives. Facilitation of the market is not yet developed, though ENOVA, the Norwegian National Energy Agency under the Royal Norwegian Ministry of Petroleum and Energy (MPE) has organised a few independent activities (seminars, trainings)¹³⁶. Clearly there is a strong need for ESCO market promotion, information dissemination, and an increase of trust if the market is to reach a higher level of development.

Financing ESCO projects

The most common solution for funding ESCO projects is using the municipalities' own internal funds (Mørk 2013). Grants for ESCO projects are available and are used from ENOVA (Morris 2012).

Barriers

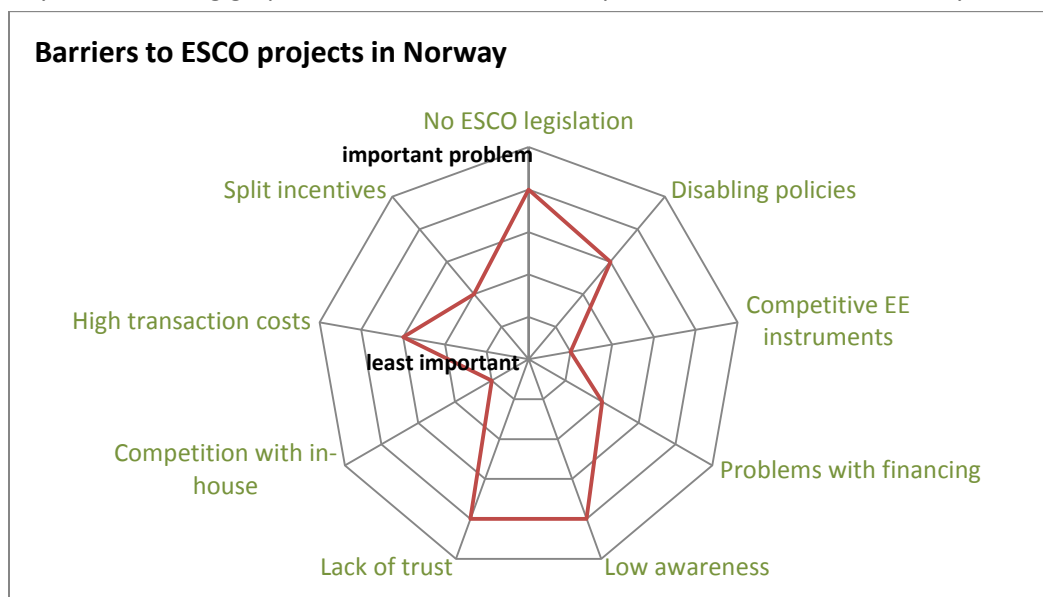
Low energy prices hinder the attractiveness of energy efficiency in general, and therefore the possible profits of ESCOs in Norway are seriously limited.

As said above, municipalities can finance the projects themselves, however in case a financial solution is to be integrated into a project, the banking sector is not yet prepared to participate. The reluctance from the banking sector has been engraved by the financial crisis.

Mørk (2013) identified the following core barriers to EPC implementation in addition to the above:

1. Lack of knowledge about EPC on the part of municipalities and ESCOs, too;
2. The complicated and expensive preparation process for an EPC contract;
3. Insecurity about legislation and framework (public procurement);
4. Lack of capacity to prepare and later to participate in the project on the part of the client (time and knowledge);
5. Insecurity around the process and tendering/contract documents.

In summary, the following graph illustrates the relative importance of barriers in Norway:



¹³⁶ See more at: <http://www.enova.no/innsikt/generelt/lonnsom-energieffektivisering-med-garantert-besparelse/475/971/>

Conclusions and future expectations

The Norwegian ESCO market has started its stride towards development, nevertheless it is still in an embryonic state. It has been growing due to the general trend of climate awareness, in spite of the cheap energy available in Norway, which hinders the bankability of an ESCO project.

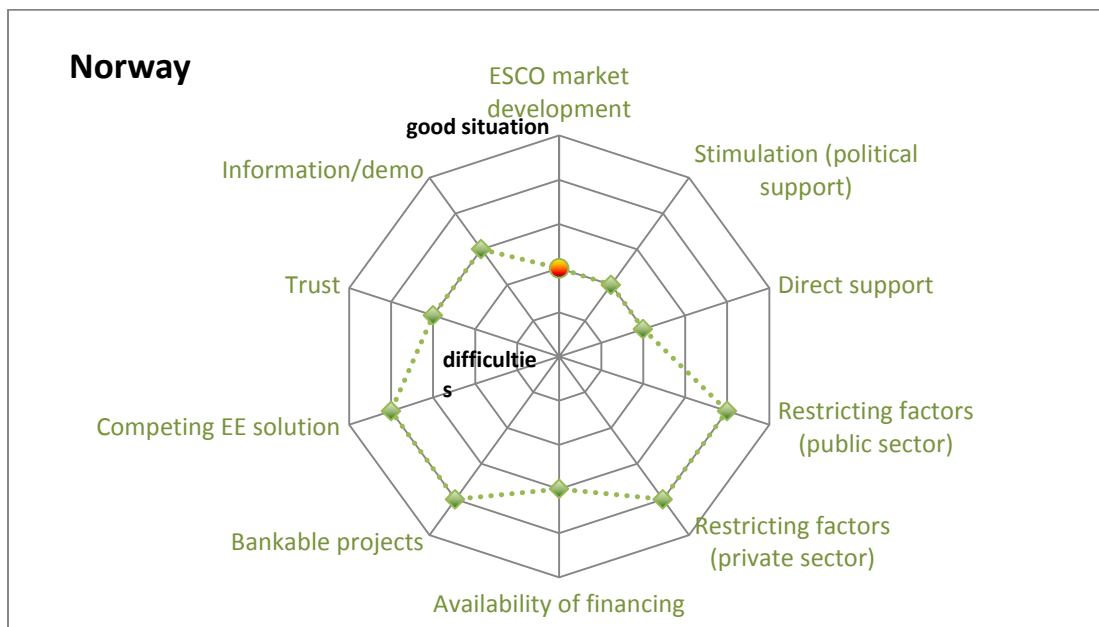
Regulation is neither supportive, nor hindering the ESCO market, however the EPC standard under preparation shows the commitment to improve the situation. The standards main impact is expected to be the increased trust in the solution, which will contribute to the active promotion done by the ESCOs themselves.

Information dissemination is a key factor for future spread of the ESCO model, and the already available examples will serve as a good basis to increase trust in this solution.

Key drivers

- Long-term and solid climate targets at municipalities;
- Environmental leadership at administrative level;
- EPC standard;
- EU projects that have developed standard documents and resulted in pilot projects.

The following graph shows the key features of the Norwegian market:



Norway in a snap-shot:

Number of ESCOs	5-10
ESCO market size and potential	market size: unknown
ESCO market trend	slow growth
ESCO association	none
Typical ESCO projects	public buildings (primarily municipal buildings, rarely state and counties-owned premises)
Main type of contract	N/A

Swiss ESCO market 2013

The market was slowly growing in 2010 (Marino et al. 2010). In 2007, the European Commission ESCO survey found 5-10 Energy Service Companies. In 2010, 76 energy contractors were identified by the national association of energy contractors, "SwissESCO", however it was not possible to determine how many of these were active ESCOs. It is probable that the number of companies that had actually carried out ESCO projects was around 7-10. These companies were local energy producers and distributors (Marino et al. 2010).

Current ESCO market

The number of companies has not changed during the period 2010-2013, and as of 2013 there are 6 active ESCOs in Switzerland (EC JRC 2012).

Reliable information about the size of the market is not available (EC JRC 2012). Existing estimates contradict each other. While a doubling of the market (estimated as €170-350 million in 2010) was foreseen by experts reported in the previous EC JRC report (Marino et al. 2010), the interviewed ESCOs in 2013 estimated a market size of €20 million (EC JRC 2012).

"SwissESCO" is an association that represents the existing ESCOs active in energy supply contracting, amongst many other energy contractors (companies that deal with added value projects, such as billing, emergency service, meter readings, etc.). Furthermore, there is an agreement amongst stakeholders that

EPC solution for the private service sector: a hotel renovation in Geneva



The renovation project of Hotel Starling was started in September 2011 with building partnership and a walk-through audit. The implementation phase ended in January 2013, and the contract will run until the end of 2016.

The renovation included the retrofit of the HVAC system in the value of 404 kCHF (€330,000). The costs of M&V using IPMVP is 18 kCHF/an (€15,000/yr), as opposed to an expected savings of 126 CHFk/an (€102,000/yr), from electricity savings of -297 MWh/an and heat savings of -642 MWh/an. The parties used the shared savings model in which the contractor will receive 100% of the energy savings during the first 4 years, and 50% from the 5th year till the end of the contract if the project performs. If the guaranteed savings are not achieved, the contractor compensates for the losses and the contract ends.

Source: Zraggen (2013)

there is a need to set up a dedicated ESCO association to reinforce Energy Performance Contracting rather than only Energy Supply Contracts (ESC). Such a body may be established as a separate association or as an affiliate of an existing organisation.

Types of projects

The ESCO market can be still seen as embryonic with only a few contracts per year. While some of the large international ESCOs are present on the market, local companies, including utilities that have extended their services to energy services indicated that there is a strong demand for small projects (with sizes less than €300,000).

Contract Energy Management and BOOT contracts have been used earlier and are applied mainly for supply side measures, especially for biomass facilities, CHP, district heating and building level heat pumps.

Promotion of the shared savings model of EPC has been done for several years and the first EPC project was started in 2009. At the moment several ESCOs are able to focus almost solely on EPC (EC JRC 2012). Large ESCOs are also interested in offering EPC, and 3 contracts have been signed so far (EC JRC 2012). Consequently projects for the improvement of HVAC, lighting, pumps, automation, motors and inverters, etc have gained ground. There are signs to move towards the Integrated Energy Contracting models (IEC), too, whereas ESCOs are interested in disseminating projects that combine supply side and demand side energy efficiency (EC JRC 2012).

Industrial clients remain to be dominant, while EPCs are implemented in social housing, private tertiary buildings (hotels) and even in residential buildings.

Regulatory factors

Switzerland is currently developing an overall energy policy, the “Energy policy 2050”, which will incorporate incentives to promote the ESCO market.

Market factors

Although the ESCO market is rather small and has not gained large popularity yet, the running projects are typically market-based and so far, the positive results are due to the individual promotion by the ESCOs and other market stakeholders. In October 2013, the first ESCO workshop was held, which is seen as a turning point and as the start of a rapid future boom (EC JRC 2012). Interestingly the preparatory and other value added services (billing, monitoring, auditing, etc.) are popular, but often fall short of actual actions afterwards. This has motivated ESCOs to promote EPC as a form of extending of audits, for example, and thus initiating a dissemination of this form of energy efficiency improvement (EC JRC 2012).

Awareness and trust

The ESCO concept (and in particular EPC) is unknown amongst clients, and according to the ESCOs’ experiences, the ESCOs introduce and promote the model themselves (Zraggen 2013). It is expected that with the first ESCO workshop in October 2013, a process is started and political leadership and the emergence of market facilitators will provide independent information, which the demand side will trust more (EC JRC 2012).

Financing ESCO projects

Banks are not well-informed about the ESCO concept and have no relevant products (Zgraggen 2013). The problem with TPF is that an ESCO project is treated as a normal loan and the future cash flow is not considered as a collateral (Zgraggen 2013). Nevertheless, there are sporadic examples of TPF from bank loans for the shared savings models of EPCs (Marino et al. 2010; EC JRC 2012). On the other hand, two private funds (SUSI and UBS) have been set up to provide incentives for ESCO investments.

Normally, though, ESCs are financed either by the client or the ESCO, whereas the contractors (ESCOs) provide the investment funds for shared savings EPC models. This may imply a leverage need after a few long-term projects, which can put a hold on the current growth due to lack of credible and bankable projects.

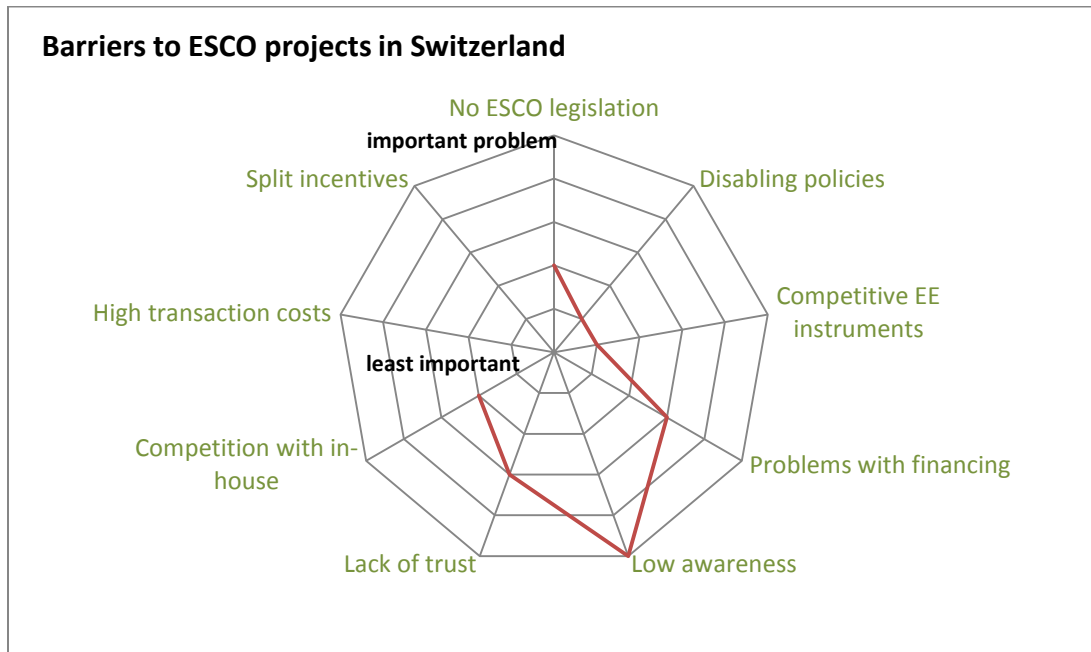
Barriers

The Swiss ESCO market is still very small, and the market has not been prepared yet for the ESCO solutions. It is believed that until now, only a few companies were interested in offering ESCO services and there was no demand because of lack of awareness about this solution. Indeed, it is expected that both the demand and the supply sides are growing now, and this will be matched with a significant growth of the ESCO market (Marino et al. 2010; EC JRC 2012).

Nevertheless there are a few barriers which should be and are addressed. The lack of appropriate financing solutions is one of the key problems. ESCOs are able to finance a few projects at the moment, but as soon as there would be a growing number of projects, the amount of loans could create a lock on further bank loans. Energy services are not directly promoted by policies yet, and according to experts this may not be a problem in itself, as long as legislative hurdles are removed. IPMVP is widely known and used, but other standard documents are not available. However, stakeholders do not see this as a problem.

Finally, the lack of information has been one of the key obstacles so far, on part of all stakeholders, and especially in case of potential clients and banks.

In summary, the following graph illustrates the relative importance of barriers in Switzerland:



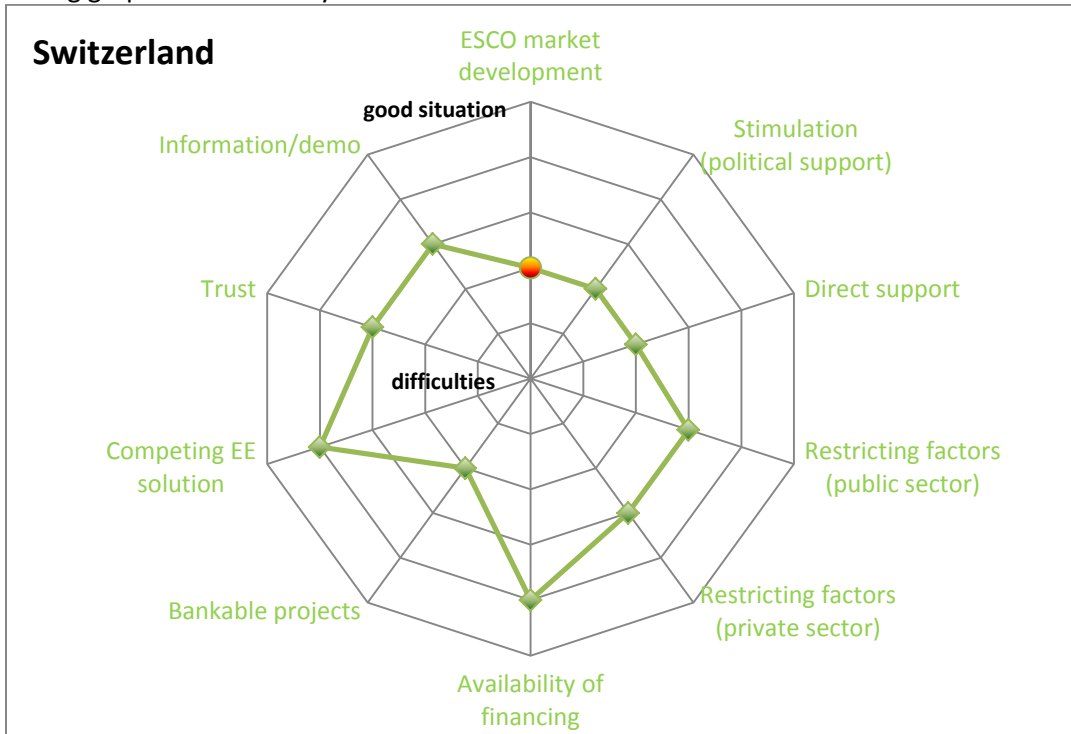
Conclusions and future expectations

ESCO experts are optimistic about the ESCO market in Switzerland. Truly, the activity related to ESCO/EPC markets is rather limited and started to be seen only recently; nevertheless it is believed that a boom can be expected in the near future. It was 4 years ago when the first EPC project was launched. It was preceded by other types of ESCO projects (BOOT, Chauffage) mainly in the industrial sector, as well as other value added services. Demand is developing now as a result of the promotion by ESCO companies. It is expected that more and more tenders will be announced. In parallel, there is an energy efficiency obligation scheme that drives demand further. An energy policy that will – among others – promote ESCOs, information and awareness raising activities are also on the rise. It is to be seen whether these activities will provide an appropriate set of incentives and regulations to move the ESCO market ahead.

Key drivers

- Energy policy 2050 (under discussion), which will incorporate incentives to promote the ESCO market;
- National ESCO association “SwissESCO” and private facilitators;
- Two private funds, SUSI and UBS that are suitable for supporting ESCO projects;
- Scientific interest in adapting the ESCO models to the local context (MSc and PhD theses);
- Popularity of the IPMVP procedure;
- Dedicated discussions and actions from October 2013.

The following graph shows the key features of the Swiss market:



Switzerland in a snap-shot:

Number of ESCOs	6
ESCO market size and potential	market size: unknown
ESCO market trend	slow growth
ESCO association	"SwissESCO"
Typical ESCO projects	industry, social housing, private tertiary (hotels) and residential
Main type of contract	Chauffage, BOOT EPC (shared savings)

South-east European countries

Albanian ESCO Market 2013

The ESCO market in Albania does not yet exist and there are no ESCO companies in the country. The importance of energy services and ESCOs are recognized by the Government and by the responsible institution for implementation of energy efficiency policies, i.e. Albanian National Agency for Mineral Resources (AKBN) and Albania –EU Energy Efficiency Centre (EEC) (EC JRC 2012).

Current ESCO market

In Albania there is not any registered ESCO or similar public or private company, that provide energy services on basis on ESCO contract. They are few companies or organization (e.g. Energy Efficiency Centre) that have implemented energy efficiency project financed by the Albanian government or by international organisation and they can provide some energy services as energy audits. These organisations could provide energy services on ESCO basis in the future (UN Economic Commission for Europe 2013).

One of the most important issues for the future development of Albania and its energy sector are the increase of energy consumption per capita and at the same time, maintaining the low level of energy intensity which would create a competitive economy in an open international market. According the one average scenario the expected growth rate of the Albanian GDP for the period 2009 -2018 is 4,5%. The forecast for final energy consumption for period 2009 – 2018 based on the Albanian National Energy Strategy (from 2009) shows that final energy consumption will increase in all sectors (26% in residential, 246% in service, 265% in industry and 241% in agriculture) except in transport sector (Albanian Government 2011).

The first National Energy Efficiency Action Plan for Albania for the period 2010 -2018 was adopted in October 2011. In 2008, the residential sector in Albania consumed more than 23% of the total final energy consumption. Electricity with 49% has the largest share on total consumption among the energy sources and then is biomass with 41% and oil products with 10%. (Albanian Government 2011)

The energy efficiency measures in residential sector should contribute to reduction of the use of electricity for space heating and hot water preparation through the introduction of central and district heating systems (these are not yet constructed in cities) as well as through use of renewable energy (e.g. solar heat systems). The energy consumption in the residential sector will be reduced through the implementation of energy efficiency buildings codes (e.g. mandatory use of thermal insulation in new buildings). Therefore it is necessary that the new Law on Energy efficiency (still in a draft version) is adopted and implemented. This draft law contains certain improvements with respect to the existing Law on Energy Efficiency (Law No.9379/2005) adopted in April 2005, but not implemented at all since the secondary legislation has never been prepared. The new Law has been prepared according the EU regulation for Energy Efficiency and it includes provisions for energy audits and energy certification of buildings, which is not mandatory at the moment in Albania. However trainings for energy auditors have been already organized by international organization. The aim is to have certified energy auditors, who will be able to carry out audits, and also to train other professionals to become auditors later when the regulation for audit will be adopted.

ESCOs are mentioned in NEEAP as one of the target groups for two measures related to development of regulation for minimum requirements on thermal quality of new and existing buildings and financial support for energy efficiency in the residential sector. ESCOs should be included in realization of energy efficiency projects, but first the regulation and financial mechanisms have to be created. (Albanian Government 2011)

The service/tertiary sector includes the commercial sector (which includes also SMEs) and public sector. This sector consumes 6% of the total energy consumption. The measures from the NEEAP are related to implementation of building codes in commercial and public buildings, improvement of heating systems for public buildings through introducing of small scale CHPs and solar systems for hot water preparation and implementation of energy audits and energy certification of buildings. The introduction of energy performance contracting is mentioned as a measure which shall be used to ensure the quality of the refurbishment of buildings and co-financing of energy savings measures. Implementation of a system for energy certification and energy audit in the service sector should result in establishing the building baseline energy consumption, the calculation of energy savings and the preparation of list with priority energy efficiency measures for commercial and public buildings, but also will enable distinguishing the energy consumption between both sectors, which is a current problem (Albanian Government 2011)

The Albanian industry sector accounts for approximately 13% of the total final energy consumption. The largest consumer of energy is the food and beverage sector with around 19,9 % and then is the building materials sector with 18,6%. The industry sector is still in a very poor condition in terms of energy intensity. The electricity contributes with 22,2 % to the energy consumption by energy sources. The energy demands of Albanian industry shall increase since it is expected the growth of the industrial production in the next period of 7-8 years. According to the first Albanian NEEAP, energy efficiency measures will be focused on the implementation of energy management systems, the introducing of modern less energy demanding technologies and the replacement of electrical motors, air compressors, and ventilation systems. The energy audit systems shall be introduced also for the industry. (Albanian Government 2011)

Because of the lack of relevant energy consumption data it is very difficult to estimate the potential for ESCOs in Albania (EC JRC 2012)

Types of projects

The potential for implementation of projects through the ESCO model in Albania lies in public sector, industry and residential sector, since all of them are in very bad conditions in terms of energy efficiency. The building codes have not been applied neither for new nor for existing buildings even after 2002 when the Law on Heat Conservation of Buildings (Law No.8937) was adopted, because the secondary legislation has not been prepared. The poor energy infrastructure and not developed district heating systems in larger Albanian cities can attract foreign investments in energy sector. ESCO projects can be implemented by foreign ESCOs which have experience in the implementation of projects on basis of BOOT contracting. The EPC contracting it is not possible due to lack of suitable regulation for public procurement and low awareness in the industry enterprises and public authorities for energy services based on energy savings.

Until now no projects have been implemented using the ESCO model or similar basis.

Regulatory factors

Albania as a member country of the Energy Community Treaty is obliged to transpose all EU legislation for energy efficiency including the EPBD and ESD. Therefore, in 2009 on basis of EU legislation the new Law on Energy Efficiency was prepared. The draft law set objectives and principles of national energy efficiency policy and introduce requirements for energy performances of the buildings, energy certification, energy audits of buildings and industry and labelling of household appliances. The Energy Efficiency Fund should be established according the draft law for financing of energy efficiency projects. Energy services should be a part of the Law on Energy Efficiency. However, although the draft was prepared in 2011 has been not adopted yet.

Market factors

The lack of district heating and central heating systems, lack of implementation of building codes and very high dependence on the heating with electricity result in very poor leaving conditions in Albanian residential and public sectors. The prices of electricity are still below average EU28, but are higher than in some EU member states (e.g. Bulgaria, Estonia and Romania) (Eurostat 2013). The electricity tariffs have been increased in the last several years. Albanian electricity production depend on production of hydro power plants and if their production decrease due to dry years Albania have to import electricity at market prices from neighbouring countries. In the last 10 years only in 2011 Albania exported electricity to the neighbouring countries. Demand for electricity will growth in next 7-8 years and it can cause problems with electricity supply to households. Therefore the government have to invest in new production capacities or to implement energy saving projects. ESCOs can be used as mechanisms for implementation of EE projects. (AKBN 2011)

Awareness and trust

The information campaigns for promotion of energy efficiency and renewable energy sources have been organized in framework of projects realised by international donor or financial institutions as: KfW, World Bank, EBRD or GIZ. Promotion campaigns for ESCO have not yet been organized (EC JRC 2012)

Financing ESCO projects

The Energy Efficiency Fund should be established pursuant to the draft of the Law on Energy Efficiency, which has not yet been adopted. However, this is not enough, since the secondary legislation including: methodology for energy performance of buildings, energy certification and energy audit in order to enable preparation of suitable project proposals and monitoring of archived savings has also to be prepared. (Energy Charter Secretariat 2013a)

The financing of energy efficiency projects in Albania has been mainly provided through international financial institution as: EBRD , IFI, KfW or WB as well as through international funds.

EBRD established in 2012 the Regional Energy Efficiency Programme for the Western Balkan (REEPWB) which aim is to support energy efficiency for public and private sectors –and to encourage the public sector to take a leadership role as stipulated in the NEEAPs. Albania is one of the partner countries on the projects.

The EBRD also provides a credit line facility window (WeBSEEFF II) which consists of 75 million EUR. The credit lines will be extended to local financial institutions for on-lending to smaller scale energy efficiency and renewable projects. This finance is available for public and private sector.

A total of 50 million EUR has been allocated by the EBRD for the direct investment facility (WebSEDF). This facility intends to provide financing to ESCO projects for energy efficiency improvement in industrial enterprises.

Barriers

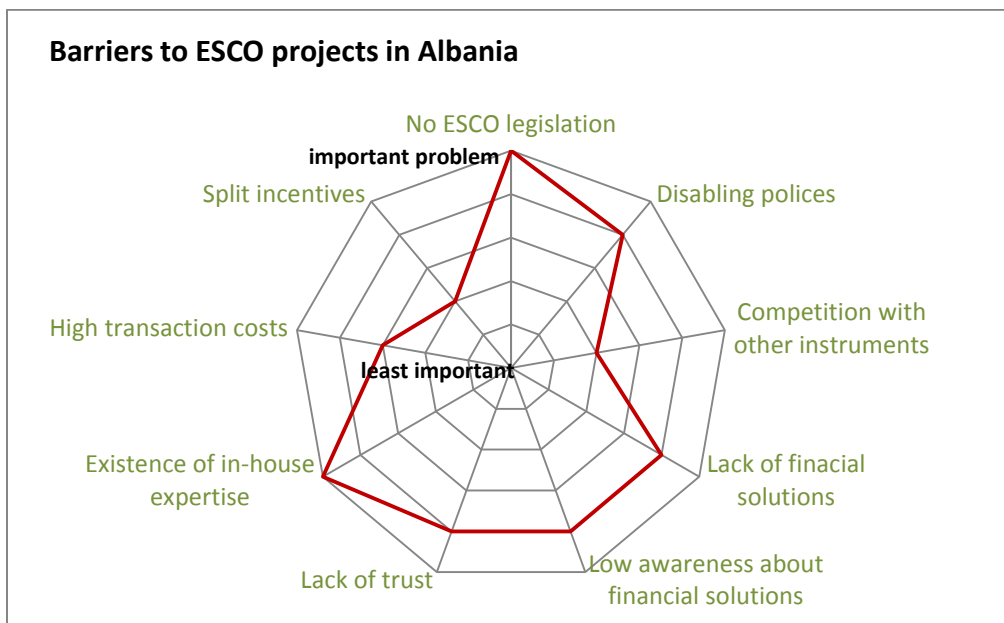
The lack of legislation is main barrier for development of ESCO market in Albania. The new Energy Efficiency Law has not yet been adopted, although the draft was prepared in 2012. Energy services and ESCO should be defined by this law. However, the secondary legislation related to this law has to be prepared and implemented after adoption of the law. The experience from the previous energy efficiency Law shows that regulation is more declarative than operational. The public procurement regulation also has to be changed in order to regulate process for tendering of energy services. The procedure for public procurement should be less complex, more flexible and more transparent.

There is a lack of proper financing mechanisms for energy efficiency projects in general. The commercial banks do not have flexible mechanisms as well as technical expertise to support and/or to promote financial schemes, although loans for energy efficiency and renewable energy are available on the market. The interest rate for loans from commercial banks is high (13%-17%) which makes the investments in energy efficiency projects not attractive. Even in the banks that offer EE loans the procedure are very complicated and requirements toward clients are higher than for the normal loans, while the interest rates are only 1% lower that for the other loans (EC JRC 2012). There is lack of financial incentives provided by government. The government could introduce tax rebates for companies that will implement ESCO projects as well as for products and equipment related to energy efficiency and energy supply.

There is a lack of promotion activities for energy services and projects on ESCO basis in the country. The government and state authorities should play a very important role in the promotion of ESCO and energy services through organising information and awareness rising campaigns for public and private sector. There is lack of good demonstration energy efficiency or renewable projects realised though ESCOs (EC JRC 2012).

The other barrier is lack of in depth knowledge on ESCOs by the experts in the energy efficiency field (EC JRC 2012).

In summary, the following graph illustrates the relative importance of barriers in Albania:



Conclusions and future expectations

The key success factor for development of an ESCO market in Albania should be the new Law on Energy Efficiency as well as preparation and implementation of related secondary legislation. Implementation of the NEEAP also should be a driving force for the ESCO industry, since energy services and ESCO are mentioned as one among priorities. Establishment of an Energy Efficiency fund issuing guarantees for loans should improve the financing of energy efficiency measures and can attract domestic and foreign investors. Government and public authorities on national and local level should contribute to increase of awareness for ESCOs through involvement in preparation and realisation of campaigns. International organisation shall be involved in organising training and realisation of demonstration pilot project through technical expertise and know how.

Possible break-through points

- New Law on Energy Efficiency;
- Development of secondary legislation;
- Energy Efficiency Fund;
- Organizing of training for EE experts;
- Increased awareness raising activity.

Albania in a snap-shot:

Number of ESCOs	No ESCO
ESCO market size and potential	Not available
ESCO market trend	On ground
ESCO association	none
Typical ESCO projects	No ESCO project
Main type of contract	Not available

Bosnia and Herzegovina ESCO market 2013

The market for ESCO services in Bosnia and Herzegovina is still at a very preliminary development stage. There are few domestic and foreign companies that started to provide some energy services for some municipalities (mainly as heat suppliers). These companies try to increase the interest of the public and of the private sector in energy efficiency projects. However, the lack of a regulatory framework is still the main barrier to the development of an ESCO market in Bosnia and Herzegovina (BiH).

Current ESCO market

Although there are officially no ESCOs operating in Bosnia and Herzegovina, several companies provide energy services and try to reproduce the ESCO concept (mainly as heat energy suppliers) (UN Economic Commission for Europe 2013). They have concluded contracts with municipalities on the basis of a PPP (Public Private Partnership). Actually, they invest in new boilers for district heating systems and then they sell heating energy to municipalities as well as to households. They mostly use biomass as energy source for boilers, given the large biomass stocks available in BiH.

The first National Energy Efficiency Action Plan (NEEAP) of BiH for the period 2012 -2018 was prepared with the support of USAID and GIZ during 2012 (Petrovic 2012). An overall indicative energy efficiency target of 12.47 PJ of final energy to be saved by 2018 is established in this plan. This amount of energy corresponds to 9% of the average annual total final energy consumption registered in the period 2006-2010. According to the NEEAP, the biggest part of the target (5.25 PJ) will be achieved by energy efficiency improvement actions implemented in the residential sector, whereas the tertiary sector, industry and the transport sector will respectively contribute to target achievement with 1.62 PJ, 4.82 PJ and 0.87 PJ. It has been estimated that energy savings to be generated in the residential and tertiary sectors will correspond to €95 million/year saved in the period 2012-2018 and will require €730 million of total investments (€216 million in the residential and €143 million in the tertiary sector). Total investments required to achieve the energy savings targeted in the industrial sector will instead amount to about €440 million (Trivanovic 2013).

Around 20 cities in BiH have district heating systems operated by municipalities' enterprises, and all of them operate with big energy and financial losses. Those district heating systems have a potential for the implementation of EE projects based on the ESCO concept. There are also opportunities for installations of CHP plants based on the ESCO concept (biomass fired boilers) (Petrovic 2012).

Types of ESCO projects

The types of ESCO projects so far implemented range from the installation of mini-heating systems, to the installation of energy efficient boilers and three-generation. Typical projects have involved guarantees on energy savings by a private company acting as an ESCO and their simple pay back time has been less than 5 years (UN Economic Commission for Europe 2013).

A good example for an ESCO project is given by the project for the district heating system of Livno, realized by the Municipality and a private company of this city. The company carried out all project phases including planning, design, building construction and supply of equipment for the new biomass boiler plant in Livno. A biomass CHP plant (1,4 MWeI and 8MWth) and a solar park with power capacity of 5MW will be also installed during a subsequent project phase. Besides heat supply, the company is going to offer energy efficiency measures in municipality buildings including the introduction of energy management for public buildings (Petrovic 2012).

This company has planned to implement a similar project in two other towns of the country (Petrovic 2012).

There are also foreign companies that have subsidiaries in BiH which provide energy services. For example, Econ Krobath GmbH from Austria realized several energy service contracts for public buildings (mostly hospitals) and residential buildings through its subsidiary company in Banja Luka. The company has taken over operation, reconstruction and maintenance of central heat plants in buildings. Overall, these company types realized 6 projects with a total power capacity of 3.464 kW over a total floor area of 40.595m² (ECON 2013).

Regulatory factors

The regulatory framework for energy efficiency in BiH is established at the level of the Federation of BiH and the Republika Srpska. ESCOs and energy services are defined by the Laws on Energy Efficiency (Trivanovic 2013).

The Law on Energy Efficiency by the Federation of BiH is still in its draft version. It has been accepted in the Parliament as a proposal and now it is under the procedure of public discussion and amendmens.

Pursuant to art.40 of this draft version, the operators of distribution systems and energy suppliers are obliged to offer and to promote energy services. The offer for energy services has to include measures for the improvement of energy efficiency, prices and financial mechanisms proposed, type of contract to be stipulated and indicators to monitor and verify energy efficiency improvements. In addition, the art 41 establishes that financing for energy services will be provided by involved energy suppliers, operators of distribution system or facilities' owners, completely or through third part financing (Government of Federation of Bosnia and Herzegovina 2012).

The Law on Energy Efficiency (No.01/1518/13) was instead adopted by the National Assembly of the Republic of Srpska in June 2013. This Law includes a definition of energy services and ESCOs and establishes that energy services can be provided by ESCOs or other legal entities. The financing of energy services can be provided by ESCOs or facilities' owners, completely or through third part financing. The repayment of investments will have to be provided by achieved energy savings (The National Assembly of the Republic of Srpska 2013).

Competitive and functional tendering are admitted by the Public Procurement Law of both government entities and can include selection criteria based on achieved energy performances and NPV of investments. Tenders can be won by a single company or a consortium and subcontractors can be used by tender winners (Barnett 2013).

Market factors

Increased electricity and heating energy tariffs for households and industry can lead to a growth of the market for energy services in BiH. At the moment the applied prices for electricity are among the lowest in Europe, since BiH is a country in West Balkan, which is a net exporter of electricity.

The ESCO concept can provide a solution for the financing of energy efficiency projects in the public sector (both on the national and the local/canton level) since this sector is facing a shortage of financial resources. The benefit for the public sector would be a general improvement of comfort conditions in public buildings (hospitals, schools, public administrations, etc.). ESCO services can create new activities and job opportunities also in the private sector (Petrovic 2012).

The municipalities of BiH are very interested in the implementation of energy efficiency projects, given the associated energy savings and lower energy costs for heating. Projects which include the reconstruction of networks for heat supply can in particular improve the quality of heating services. Most of the main municipalities in BiH have already signed the Covenant of Mayors initiative and have already submitted their SEAPs, this indicating that they can start with the implementation of EE measures on their territory (Petrovic 2012).

Information, awareness and demonstration

Public campaigns for the promotion of energy efficiency in the public sector and households have been realized in frame work of projects implemented by international organizations as USAID, GIZ and UNDP.

Financing ESCO projects

A Fund for Environmental Protection was established by the Law on Environmental Protection (No.01-337/03) in the Federation of BiH in July 2013. It is a revenue fund financed by fees collected from environment polluters and from other sources as loans, grants from donors, budget of the Federation of BiH. This fund will be available to be used for financing projects based on the ESCO principle (Environmental Fund of the Federation of BiH 2013).

A revolving fund for environmental protection and energy efficiency operates also in the Republika Srpska. This fund co-finances projects for the improvement of energy efficiency and renewable energy sources in the public sector. Campaigns for the raising of public awareness on energy efficiency and environment can be also financed through this fund. Initiatives financed can include projects implemented by the ESCO model (Fund for Environmental Protection and Energy Efficiency 2013).

The European Bank for Reconstruction and Development (EBRD) is considering a framework financing operation of €75 million to support selected private and municipal sub-borrowers undertaking investments in energy efficiency and renewable energy in the Western Balkans region, including Albania, Bosnia & Herzegovina, Croatia, FYR Macedonia, Montenegro and Serbia. This financing facility will be supported by a grant from the European Union through the Western Balkans Investment Framework ("WBIF"). The EU grant will be used to fund technical assistance and incentives to end-borrowers. The envisaged structure of the proposed investment framework builds on the first successful model of the Western Balkans Sustainable Financing Facility (WeBSEFF) launched in 2009. The new framework also aims at opening up the market to municipal energy efficiency projects and stepping up the policy dialogue to set up the necessary regulatory framework and support system for the emergence of the ESCO market (EBRD 2012).

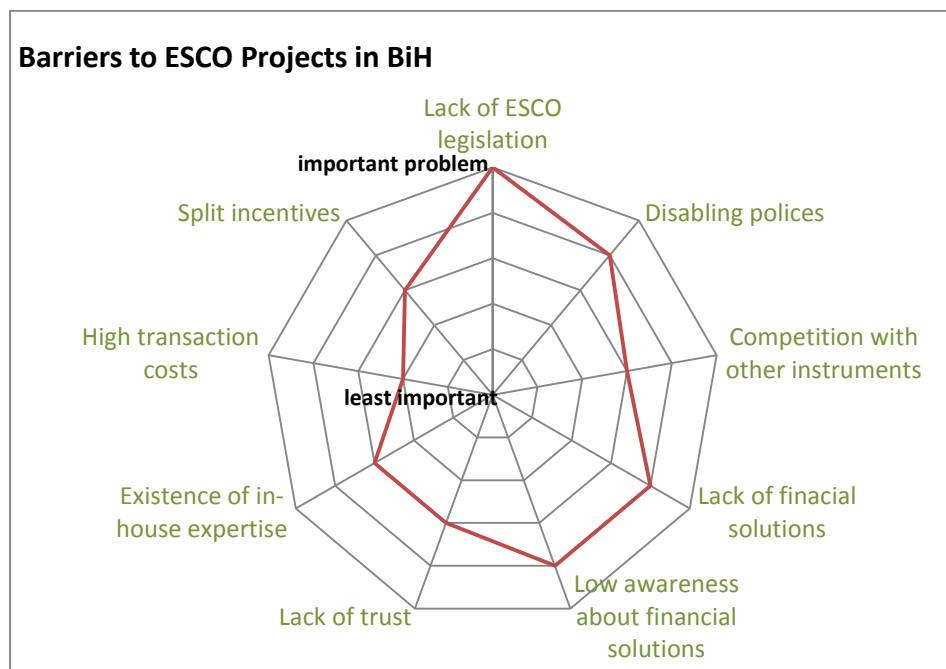
Barriers

The following barriers constrain the development of the ESCO market in Bosnia and Herzegovina:

- A regulatory framework for energy efficiency is not yet adopted and therefore a proper ESCO business cannot be established.
- Public procurement procedures are in place, but are not enough clear.
- There is a lack of financing products provided by commercial banks. Moreover, loans from banks are with high interest rate. Overall, banks are not interested in EE projects, since they have not expertise to evaluate the projects.

- There is a lack of expertise in the preparation of energy efficiency projects based on the ESCO concept.
- There is a lack of reliable energy consumption data which are crucial for the identification of the baseline consumption.
- Electricity tariffs are among the lowest in Europe.
- The very complex administrative structure (both at the national and the local level) constrains a faster approval of EE projects in the public sector. Moreover, the ownership of as well as responsibilities over public buildings (in particular health and education buildings) is not enough clear.
- There is a lack of awareness on the application of the ESCO concept for EE project implementation.

The following graph illustrates the relative importance of barriers to the ESCO market in Bosnia and Herzegovina:



Conclusions and future expectations

The crucial factor for development of the ESCO market will be the implementation of energy efficiency laws in both government entities in BiH. At the same time, an improvement of the public procurement procedures for energy services and the development of standard contract templates for EPC can have a positive impact on the development of this market. A market driving force can be represented also by the sustainable energy action plans (SEAPs) that have been signed by 14 municipalities including most of the biggest cities in BiH. In this context, the ESCO concept can be considered in particular as one of the models for the implementation of EE measures in public buildings (Petrovic 2012).

Possible break-through points:

- Energy efficiency Law in both entities
- Procurement procedure and standard contract for energy services
- Financing facilities for the building sector and industry
- Introduction of higher tariffs for electricity
- Implementation of NEEAPs and sustainable energy action plans (SEAP)
- Intensification of awareness raising activities for the promotion of the ESCO concept

Bosnia and Hercegovina in a snap-shot:

Number of ESCOs	0
ESCO market size and potential	N/A
ESCO market trend	At a very preliminary development stage
ESCO association	None
Typical ESCO projects	Energy efficiency improvement of district heating in municipalities and central space heating in residential buildings
Main type of contract	"chauffage"

Kosovo* ESCO market 2013

* This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

The ESCO market in Kosovo* is still practically not existent. Although Kosovo* adopted the Law on Energy Efficiency and set a secondary legislation, the lack of regulation related to ESCOs is still the main problem for the development of this market.

Current ESCO market

As a signatory party of the Energy Community Treaty (ECT), Kosovo* is member of the Task Force on Energy Efficiency (TF EE). Under the guidance of TF EE, the Ministry of Economic Development (MED) developed the First National Energy Efficiency Action Plan (NEEAP). The objective of Kosovo* is to achieve a 9% energy saving target (compared to a baseline consumption) by end of 2018 (MED 2011).

Kosovo National Energy Efficiency Action Plan (NEEAP) sets long term energy efficiency targets for the period 2010-2018 and intermediate targets for 2010-2012. In determining the medium term targets, the NEEAP considered a situation of (MED 2011):

- Lack of a functional Energy Efficiency Agency and non-existence of Regional Energy Offices;
- Lack of a fund for energy efficiency;
- Lack of a labeling system for the energy performances of buildings;
- Lack of a legal procedure mandating procurement of EE equipment for public entities;
- Lack of energy service companies;
- Lack of complete data from accurate surveys regarding EE in the public sector;
- Lack of mandate to public sector entities to undertake EE measures;

A large energy-saving potential exists in the public sector. Many administration, health and educational buildings are under state control and could be used to showcase EE improvements and provide the basis for a local ESCO industry that performs energy audits and implements projects, perhaps supported by grants and IFI loans (Task Force on European Integration 2012).

The highest potential for EE improvement is in heating and electricity generation, where the current energy efficiency level is considerably under that determined by EU relevant directives and current technological standards (in particular concerning furnaces and small heating equipment). For home appliances there is a possibility to increase the EE average by up to 100%, whereas the current thermal energy generation can be improved by up to 40% with new lignite combustion technologies. Further improvements can then be achieved by introducing cogeneration of electricity and heating. (Task Force on European Integration 2012)

Types of ESCO projects

There have not been energy efficiency projects implemented by ESCOs in Kosovo* (EC JRC 2012).

A number of energy efficiency measures in the public sector (e.g. in schools, hospitals and government buildings) have been implemented with the support of the donor community, including the EC, GIZ, etc.. Efficient lighting in buildings and streets and thermal insulation of buildings are among the key interventions.

Regulatory factors

Kosovo has made substantial progress in developing a legislation and regulations in the energy sector to bring it in line with the EU *acquis*, as required under the Energy Community Treaty. However, it needs to continue completing the legal and regulatory framework in the area of energy efficiency as required under this Treaty. The major legislation and regulation relevant for energy efficiency and potentially affecting the ESCO business are:

- Law on Energy, No. 03/L-184, 15.11.2010
- Law on Energy Efficiency, (No. 04/L-016, 22.07.2011)
- Law on Public-Private Partnerships, (No. 04/L-045, 21.10.2011)

These Laws, however, do not include provisions for energy services and ESCOs.

Kosovo needs a full operational EE Agency as established in the Law on Energy Efficiency, No. 04/L-016, 22.07.2011. The role and responsibilities of this agency are described also in the MED Regulation No.08/2011 “On Internal Organization of the Kosovo Agency for Energy Efficiency”.

The Law on Energy envisages the possibility of establishing of energy offices at the communal level. The MED regulation is supposed to provide training and other institutional support so that these offices can be created and be running within a reasonable period of time. Several donors, such as the European Commission Liaison Office (ECLO) and GIZ in Germany, have funded energy training activities to communal officials in the past (Task Force on European Integration 2012).

Further support for a comprehensive development of the energy auditing institutions and infrastructure as well as for the establishment of the ESCO businesses should be part of policies developed in the area of energy efficiency in Kosovo. Moreover, actions anticipated in the NEEAP need to be undertaken in order to allow the take-off of ESCO activities (Task Force on European Integration 2012).

Finally, the Kosovo Government, possibly with donors' assistance, should consider modifying its national public procurement policy to enable energy services contracting (Task Force on European Integration 2012).

Market factors

Kosovo's electricity tariffs are among the lowest in the region. Despite the low prices, the main issue in the sector is non-payment of energy bills. Similar to many other countries, district heating billing is based on the surface area of consumer dwellings, not on metered consumption. In Prishtina, district heating serves about 20% of the population. Pursue of price liberalization is the sine qua non for successful capital investments, particularly private ones. The Energy Community Regional Energy Strategy states that the existing price levels (not fully cost reflective) in the Contracting Parties (including Kosovo) cannot support new generation investments, neither by attracting private investors nor by providing domestic utilities with the means to invest on their own. When price levels are below the cost of new investments, it will not be possible to attract new commercially driven investments and this situation may even worsen the supply-demand balance. If the investment in the long-term remains inadequate, there is a serious risk for the security of supply. (Task Force on European Integration 2012).

Awareness and trust

Information campaigns promoting energy efficiency have been so far realized only in the framework of some projects implemented by international organizations and financial institutions.

Financing ESCO projects

The majority of funds currently available target the private sector, households and SMEs in particular. This implies that funds and financing mechanisms must be increasingly directed to municipalities and public buildings in general. The borrowing capacity of the public sector at the local and the national level is currently very limited and hence efforts will be required to find alternative models that allow funding to be made available to this sector.

Substantial funding is generally required to implement EE measures and meet NEEAP targets and funds available at regional level may play a key role in this respect.

The Kosovo Sustainable Energy Projects (KOSEP) framework was established by the European Bank for Reconstruction and Development (EBRD) in May 2013. The Bank provided a € 12 million credit line for Kosovo's financial institutions to be used to provide individuals and Small and Medium Sized Companies with credit for investments in energy efficiency and renewables (KOSEP 2013).

KOSEP facilitates incentive grants up to 20% of investments for Kosovars who invest in energy efficiency projects in the residential and business sectors. The incentives are given to eligible applicants who implement their projects with the support of one of the participating financial institutions (KOSEP 2013).

The EBRD has secured the backing of the European Union, who will further provide incentives up to 20% of the value of the loan to all participating sub-borrowers, both individuals and businesses.

Eligible actors for residential loans are: corporate entities, including housing management companies, ESCOs, suppliers and installers or any other service companies providing maintenance, operation, construction and refurbishment services upon contractual agreements signed with building owners/occupants. (KOSEP 2013)

For business credit lines the sub-borrowers must be private enterprises, firms, businesses, sole proprietors or other private legal entities formed under the laws operating in Kosovo (KOSEP 2013).

They must not be majority-owned or controlled by the state or by any other political, governmental or administrative body, agency or sub-division thereof. ESCOs are also eligible sub-borrowers if the energy end-user satisfies the SME definition (KOSEP 2013).

Finally, it is worth mentioning that credit lines for a total of €35 million are made available by the German KfW through two local commercial banks, to support households and small business energy efficiency measures. The interest rates on loans for EE measures are however generally very high in Kosovo; they range from 11% to 13% (Task Force on European Integration 2012).

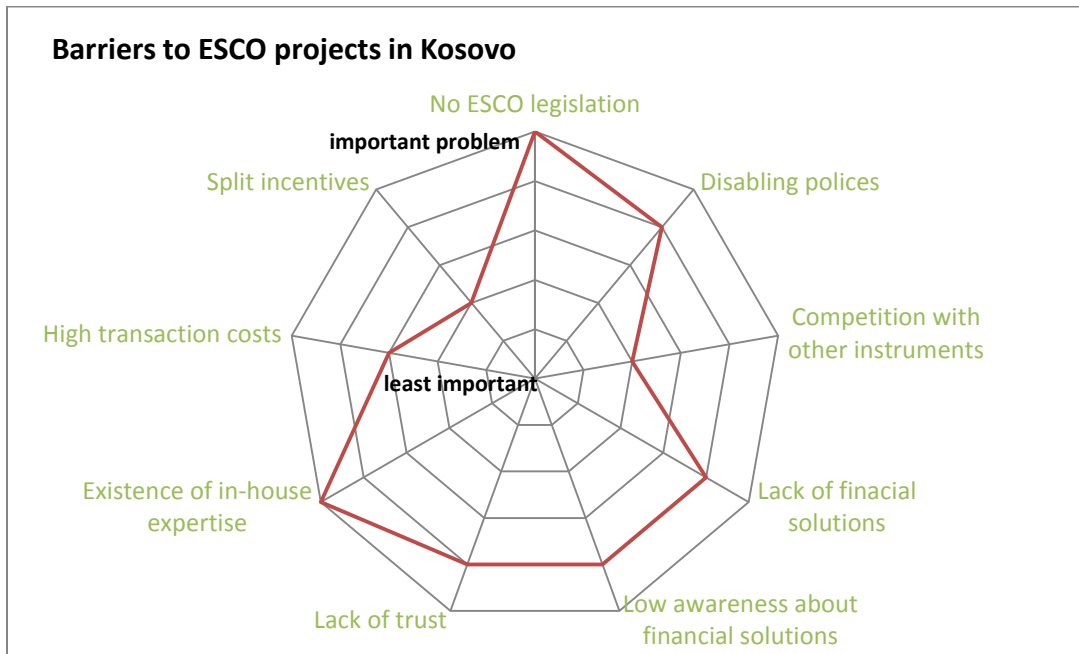
Barriers

The major barriers to the development of the ESCO market in Kosovo are (EC JRC 2012):

- Lack of legal and regulatory frameworks;
- Lack of incentives of any kind;
- Lack of know-how and expertise for the development and implementation of ESCO projects;
- High investment costs for energy efficiency technology;
- Lack of energy efficiency funds;
- Lack of demonstration projects and information campaigns;
- Energy prices are low and cross-subsidized, while non-payment of energy bills is a significant issue;
- Lack of energy data gathering and monitoring systems.

Incentives can help to overcome barriers to entering the market, for example, through special programs offering financial or technical support, or even temporary exemptions from standard administrative procedures. Incentives should be both of the demand-pull as well as the supply-push variety. Examples of important demand-pull incentives are codes and standards creating end-user awareness and making concessionary financing available. Supply side measures involve actions such as providing tax incentives and financing for enterprises, easing import restrictions and duties on importing energy efficient equipment, training of auditors, architects and contractors, etc. (Task Force on European Integration 2012).

The following graph illustrates the relative importance of these barriers in Kosovo:



Conclusions and future expectations

The development and the implementation of a legislation and regulations related to ESCOs can enable the introduction of energy services in the public and private sectors. The implementation of pilot programs based on the ESCO model in public buildings is expected to serve as a positive example for other sectors, such as the industry and the commercial sector. These programs could be coupled very well with more developed public procurement policies that facilitate energy services. Permitting all-in-one bids for equipment, services and energy savings performance guarantees can enable contracting for EE building upgrades and ESCO contracting can allow achieving this objective. Moreover, the bundling of many building upgrades into one procurement package could lead to significant economies of scale and cause a stronger interest by potential bidders. This type of initiative could also stimulate demand for energy services and attract local and international equipment suppliers, vendors and contractors into the EE market (Task Force on European Integration 2012).

On the other hand, campaigns to raise awareness about energy services and ESCOs are another important potential driver of the ESCO business in Kosovo.

Possible break-through points

- Law on Energy Efficiency;
- Development of secondary legislation;
- Energy Efficiency Fund;
- Implementation of pilot projects in the public sector;
- Intensification of awareness raising activities.

Kosovo in a snap-shot:

Number of ESCOs	No ESCO
ESCO market size and potential	<i>Not available</i>
ESCO market trend	An ESCO market is basically not existent in Kosovo.
ESCO association	none
Typical ESCO projects	No ESCO project
Main type of contract	Not available

FYROM ESCO market 2013

The ESCO market in the former Yugoslav Republic of Macedonia is still undeveloped, since the market conditions are not ripe enough for ESCO businesses to grow, due primarily to the lack of legislation. MT-ESCO, the first ESCo company established in the country, never functioned properly and was later closed down.

Current ESCO market

Within the framework of the “Sustainable Energy Project”, financed by GEF and implemented by the World Bank (WB), MT-ESCO, the first ESCO company in the country, was created in 2006. It was established as a joint venture between Toplifikacija AD, Skopje (district heating provider) and MEPSO (transmission system operator) (Stefanovski 2013)

Currently there are no public or private owned ESCO companies in the former Yugoslav Republic of Macedonia (EC JRC 2012).

There are several companies in FYROM that can provide energy services, such as energy audits, EE project design and development as well as installation of energy efficient equipment and maintenance of energy equipment. However, these companies do not use ESCO contracts for their services.

The renovation of public buildings is one of the measures described in the first NEEAP, and one of the priorities set by the government. The Ministry of Economy supported by the World Bank and international and local experts, prepared a draft version of the National Programme for Energy Efficiency in Public Buildings (NPEEPB) for the period 2012-2018. One of the objectives of this programme is to encourage the development of the market for energy efficiency services and products in the country (Kirov 2012).

The programme targets energy efficiency renovations of all public buildings owned by the government, ministries and all 84 municipalities, plus the City of Skopje. In total, 2,441 public buildings were analysed under this programme with total annual energy costs of €42 million (Kirov 2012).

According to the draft of the NPEEPB, the moderate investment scenario can create energy savings of €13.9 million per year with a total investment of €92 million if implemented in all targeted public buildings. The high investment scenario can create energy savings of €18.5 million per year with a total investment of €167.5 million. The average simple payback period is 9 years in the high investment scenario and 6 years in the moderate investment scenario (Energy Saving International, Timel, and E3 International 2011).

It is very difficult to estimate the potential of the ESCO market in the residential sector, since there is no suitable energy consumption data. The energy certification of buildings has not started yet, so there is no baseline energy consumption and savings calculation method.

Types of ESCO projects

In FYROM, there has been no energy efficiency projects implemented based on the ESCO concept yet.

Energy efficiency projects have been implemented on the basis of contracts established by consultancy services for energy efficiency issues and energy audits, including the installation, inspection and maintenance of equipment.

There are several municipalities in the former Yugoslav Republic of Macedonia that have started to develop and implement energy efficiency projects in their buildings (e.g. schools, kindergartens and administrative buildings) as well as for street lighting. They have signed contracts for energy audits and preparation of projects.

Regulatory factors

The Energy Law (No. 07-610/01), adopted in February 2011, provides the basis for the development of an ESCO market in the former Yugoslav Republic of Macedonia. Although the Energy Law refers to the ESCO concept and regulates some elements of the ESCO service agreements related to public entities, it does not regulate any other aspects of ESCO services. Article 139 states that public entities can establish contracts for ESCO services. This article stipulates that the investment related to ESCO projects will be financed through the reduction of energy costs resulting from energy efficiency upgrades (Ministry of Economy 2011).

In addition, the Energy Law states that the public sector entities have to apply energy efficiency criteria in the public procurement tenders for goods and services. In general, the Macedonian legislation does not prohibit the introduction of ESCO businesses. According to the Energy Law, the government should establish an Energy Efficiency Fund to finance energy efficiency projects. At the moment, the government is holding negotiations between the relevant ministries on the structure of the Energy Efficiency Fund (EC JRC 2012).

Secondary legislation related to energy audits and energy certifications of buildings was adopted in June 2013. Since the Ordinance for Energy Auditing (No.12-3644/7) was only adopted recently, it will take some time for the development and the establishment of a system for energy audits and certifications of buildings. Energy audits are only mandatory for public buildings (Ministry of Economy 2011).

Energy audits and energy management systems are not mandatory for the industry, so it is difficult to set baseline consumption levels and estimate energy savings. The Energy Law does not require mandatory energy audits for the industry (Ministry of Economy 2011).

Market factors

The rising prices of electricity and heating for households and industry can drive the growth of the market for energy services. Since both households and industry are faced with shortage of financial means, the ESCO concept can provide solutions for financing energy efficiency projects, but only if the environment for the ESCO market is improved.

Municipalities are also very interested in the implementation of energy efficiency projects that result in energy savings and lower energy costs. Most of them have already prepared local energy efficiency action plans and have started seeking technical expertise and financial support for their implementation.

Awareness and trust

The public campaigns for promoting energy efficiency in households have been conducted within the framework of projects implemented by international organizations, such as USAID, GIZ and UNDP.

In the last couple of years, the Ministry of Economy together with the Austrian distributor for electricity EVN have carried out campaigns for energy efficiency in households.

Financing ESCO projects

Commercial banks are aware of the ESCO concept and have shown interest in being involved in the development of ESCO projects, but with existing financial products and conditions. They do not have dedicated credit lines for financing ESCO projects. The offered credit lines for financing energy efficiency and renewable projects in households and SMEs are associated with high interest rates, and are not favourable towards the development of ESCO projects. The banks are also conservative and inflexible regarding the collateral of their financial products, and they require, as security, a mortgage on real estate or a pledge on equipment.

Although the Energy Law enables the creation of an Energy Efficiency Fund, the Fund has not been established yet. The Fund can be one of the possible financial models for ESCOs, if such a financial model for the NEEP program is chosen by the Government.

Only few municipalities are creditworthy in FYROM (most of them are in Skopje region) and can apply for loans (the requirements for applying for loans are described in the Law for Financing of Local Self-government Units). The other municipalities are not credit worthy to undertake projects using the ESCO model (Gecevski 2013).

Barriers

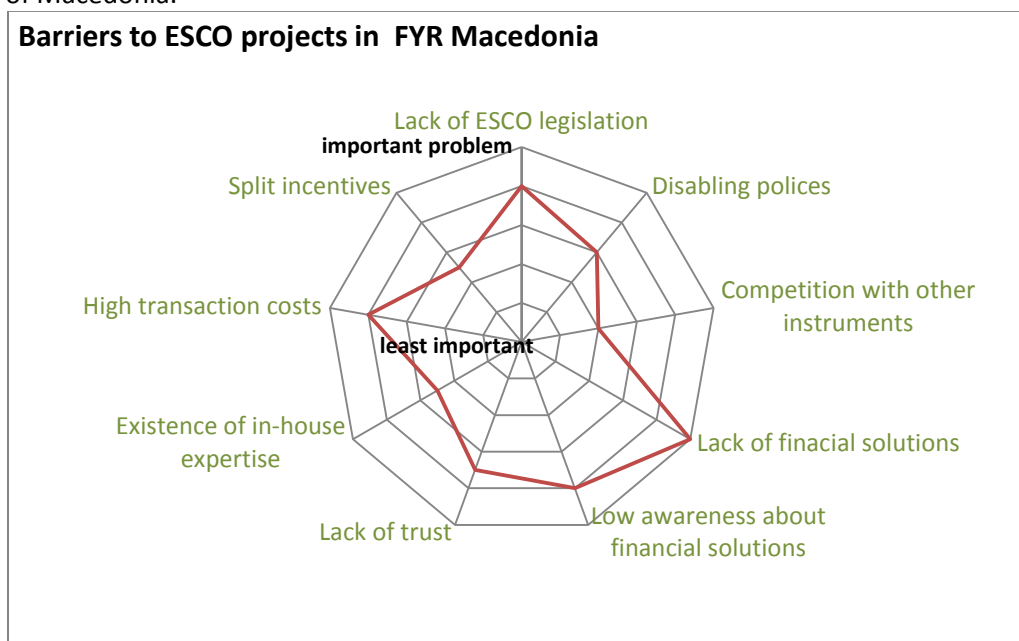
There are lot of barriers for the development of the ESCO market in the former Yugoslav Republic of Macedonia (EC JRC 2012):

- The regulatory framework still needs improvement. Although it exists, there are still some gaps related to the requirements necessary for the creation of an ESCO market;
- Lack of awareness for the ESCO concept among all relevant actors: public entities, financial institutions, private companies, professional associations, etc;
- Lack of recognition of savings generated by energy efficiency projects;
- Lack of standardized energy performance contracts. The Energy Agency can be involved in the preparation of a draft version of the contracts;
- Commercial banks are not ready to finance ESCO projects with favourable interest rates, and they still require very demanding collateral terms for their financial products;
- Lack of expertise for preparation of ESCO projects;
- Lack of reliable energy consumption data which is crucial for the establishment of baseline consumption;
- Low electricity prices (one of the lowest in Europe) and not liberated energy market
- Additional barriers for the development of ESCO companies are as follows (Lazar Gecevski.2013):

- Public institutions still receive recourses for covering their operating costs, including energy bills from the central budget. If energy costs were reduced due to the implementation of energy efficiency measures, the budget would be automatically reduced by the total amount of savings in the following year.
- The accounting system for budget users does not permit the separation of energy savings from other expenditure items. Under the current system, the municipalities may only borrow in general obligations, to be repaid from the general municipal revenues.
- The provisions in the Law on Public Procurement made it impractical for the ESCO model to operate. The Law on Concessions and Public-Private Partnership-2012 should apply to contracts between public sector entities and ESCOs, but its novel tendering and contracting provisions and approval mechanisms are still untested.

Furthermore, the legal framework allows for multi-annual budgeting, however this process is made extremely difficult by the Ministry of Finance, thereby discouraging the municipalities to seek multi-annual budget lines.

In summary, the following graph illustrates the relative importance of barriers in the former Yugoslav Republic of Macedonia:



Conclusions and future expectations

The government has started a process to improve the legal framework and encourage faster implementation of energy efficiency projects. At the same time, it is currently working on the development of financial instruments for EE projects. One of the possible financial instruments is a fully operational Energy Efficiency Fund, which will function as a revolving fund. Another very important issue is the development of a system for energy certification and energy auditing of buildings, and the creation of a database for energy consumption of buildings.

Possible break-through points:

- Improvement of legislation for public procurement;
- Implementation of NEEPB;
- Fund for Energy Efficiency;
- Development of financial facilities for ESCO;
- Implementation of NEEAPs and local EE action plans;
- Increased awareness raising activity for promoting of ESCO concept.

Increasing electricity prices and the market liberalization will raise the interest in energy services in both sectors: industry and building sector. It can open the market for ESCO services, since neither the public sector, nor the industry has its own financial and technical capacity to develop and implement projects.

FYROM in a snap-shot:

Number of ESCOs	0
ESCO market size and potential	No data
ESCO market trend	On ground level
ESCO association	None
Typical ESCO projects	No ESCO projects
Main type of contract	No contract for ESCO

Montenegrin ESCO market 2013

ESCO market in Montenegro is still not developed. The national authorities of Montenegro recognised the importance of ESCOs as a concept for the implementation and financing of energy efficiency projects. The Government has established the development of ESCO market as one of the priority for improvement of energy efficiency in the country.

Current ESCO market

In the country there is not any registered company, which provide energy services based on ESCO concept. Some private companies are interested in the development of projects based on the ESCO concept (Nenezic 2012).

The ESCO report prepared by EBRD for Montenegro described some positive aspects for development of ESCO market in Montenegro (Nenezic. 2012):

- High potential for energy savings;
- Supportive primary and secondary legislation;
- Energy audits and energy management system are mandatory and in place for the public sector;
- Possibility for using savings for the operation and maintenance expenditures of public buildings;

The Project “Promotion and Implementation of Energy Audits in Public Buildings”, with financial and expert support from GTZ and the Government of Norway started an auditing campaign in public buildings in early 2009. Up to date about 40 audits have been completed under the training and WB projects. Audits ordered by public institutions, local authorities etc. are expected after adoption of the regulations i.e. in 2012 and onwards. Auditing activity will continue in next period financed by the state and donors (Ministry of Economy of Montenegro 2010).

There is no a precise figure for the size of the ESCO Market in Montenegro, but since Montenegro is a small country (with only 600,000 inhabitants) the overall potential for the ESCO business is very limited (EC JRC 2012).

Types of ESCO projects

In Montenegro there are not energy efficiency projects implemented using the ESCO concept. Several companies provide only energy audits or different type of services as installation of equipment or maintenance of equipment, but not full scope of an ESCO service.

The government has implemented several energy efficiency projects in public buildings based on loans or grants received from international donor organizations.

One of them is the Montenegrin Energy Efficiency Project (MEEP). The Montenegrin government received a loan of €6.5 million from International Bank for Development and Reconstruction (IBRD) in order to finance the MEEP, which objective is the improvement of energy efficiency in educational and healthcare facilities, including public awareness for energy efficiency. The implementation of the project started in February 2008 and will be finished in March 2014. The measures had been implemented in 13 selected public facilities (8 schools and 6 hospitals). (Sekulic 2013)

Three types of energy efficiency measures had been realized:

- Improvement of building envelopes (insolation, changing of windows and doors, etc)
- Improvement of systems for heating and cooling of the buildings and
- Improvement of the lighting system in the buildings

The energy auditing has been performed as well as pre investment monitoring was carried out in most of the buildings before the implementation of the measures. The results after implementation were evaluated and they showed significant energy savings achieved in selected public buildings (Sekulic 2013).

Regulatory factors

The legal basis for implementation of energy services in Montenegro is the Law on Energy Efficiency adopted in April 2010. The Law gives definition of energy services and energy performance contracting. It has also provisions for Public Procurement of Goods and Services, which should take in account energy efficiency by procurement of services and goods.

According to the Law on Energy Efficiency (Art 22) energy audits in buildings with useful floor area of more than 1000 m² used by public sector organisations are mandatory. The Ministry of Economy keeps records of these buildings in a special database (Ministry of Economy of Montenegro 2010).

The Law on Energy Efficiency provides the majority of requirements and obligations for the public sector, which are directly considered as measures to improve energy efficiency in the public sector (Ministry of Economy of Montenegro 2010).

Despite the fact that Montenegro had adopted the current EE Law only three years ago, the Government proceeded with the preparation of a new “Law on Efficient Use of Energy” in order to respond to a fast changing EU – legal framework and transposition of (Directive 2010/31/EU and 2012/27/EU). The Law on Efficient Use of Energy will regulate relations in the field of efficient use of

energy in end-use sectors and will initiate the development of by-laws, particularly those governing the field of energy efficiency of buildings.

The draft Law establishes a complex system of energy efficiency measures comprising among others:

- establishment and implementation of energy efficiency criteria with respect to purchases of goods and services;
- energy management;
- establishment of energy efficiency information systems and delivery of data;
- measuring of energy consumption;
- energy audits of buildings and their heating and air-conditioning systems.

The draft Law introduces the obligation to have energy performance of buildings certified, and displaying the certificates.

Energy efficiency measures may be implemented also by the provision of energy services provided by ESCOs. The draft Law defines the obligations of all participants in the process of providing energy services, as well as elements of energy efficiency contract. Mutual rights and obligations of ESCO and energy services user are determined in an energy performance contract under which the implementation of energy efficiency measures shall be paid by the agreed level of energy savings.

Pursuant to the draft Law financial means for the provision of energy services shall be provided by the energy service provider, in full or in part, from its own resources or by a third party. The amount of costs of the energy services provider, i.e., the value of investments for implemented measures to improve energy efficiency are determined and paid to the provider according to the level of energy efficiency/savings as set forth in the contract. The cost of the energy service providers and the value of investments in the implementation of energy efficiency measures is paid or returned to the provider from the savings in energy costs achieved during the reference period. The provider of energy services or a third party assumes, in whole or in part, financial, technical and commercial risk for the implementation of the energy service.

Law on Public Procurement adopted in July 2011 stipulates in article 95 that energy efficiency has to be taken in consideration as one of the economic criteria by evaluation of offers for most suitable offer.

The first National Energy Efficiency Plan for the period 2010 -2012 adopted in 2010, includes two measures related to energy services and ESCOs (Ministry of Economy of Montenegro 2010):

- Removal of barriers for alternative energy efficiency financing mechanisms in the public sector;
- Investments in utilities of municipality and public companies (demand side).

Both of these measures have been implemented only partially (Ministry of Economy of Montenegro 2012).

The Second National Energy Efficiency Action Plan (2013 – 2015) (draft version), defines three main groups of measures for public buildings (Sekulic 2013):

- refurbishment of public buildings through soft loans from international financing institutions;
- improvement of energy management in public buildings;
- establishment of alternative financing mechanisms (ESCO, EnPC) for implementation of EE measures in public buildings;

Market factors

All relevant studies and energy audits that have been carried out, showed that there is a considerable energy efficiency potential in many areas including heating and cooling of buildings. The most important consumers in the public sector services (excluding transport) are the water supply companies, the public lighting, the Ministry of education (schools, high schools, universities, dormitories, office buildings etc.) and the Ministry of health (hospitals, health centres, office buildings). Electricity is extensively used in services sector buildings. Besides the normal electricity uses, such as lighting and cooling, electricity is also used to cover space heating, hot water production and other thermal needs. There are many buildings, where electricity is the only source of energy. Petroleum products are used mainly for space heating and hot water production. Hotels and commercial buildings are the main consumers of the private sector services. Energy consumption in the public sector practically is not monitored and controlled (Ministry of Economy of Montenegro 2012).

The Government set as a priority reduction of energy consumption in the public buildings through implementation of energy efficiency measures, which includes: renovation of public buildings (schools, high schools, hospitals and administrative buildings) as well as improvement of the heating systems. The ESCO concept has been taken in consideration, because of the lack of financial resources by public sector (Ministry of Economy of Montenegro 2010).

A number of municipalities and state agencies seem to be eager to improve the energy efficiency of their facilities and are looking forward to Energy Performance Contracting as a promising new management and financing tool. Municipalities, namely the Capital City Podgorica, Bar and Tivat expressed their hope that the ESCO model will also be implemented for reducing energy costs in street lighting and in drinking water provision. The on-going EBRD ESCO-Legal Framework project aims at providing a model contract and accompanying templates in order to facilitate this process.

Awareness and trust

Information campaigns or public awareness activities for promotion of energy services and ESCOs have not yet been carried out.

A capacity building plan was prepared for the period 2011-2012 and it includes actions for both the private and public sector. Most of the activities, such as thematic round tables, conferences and trainings were already implemented.

A number of other activities outlined in the public sector were somewhat related to the capacity building exercises (knowledge about implementation of secondary legislation, training on energy management and the like). Similar activities were envisaged for the commercial sector, with special focus on energy management and securing financing for the projects and specific investments

Several activities were conducted in Cooperation with Chamber of Commerce and Business Association and big companies (Ministry of Economy of Montenegro 2012).

Financing ESCO projects

There is no state Fund for Energy efficiency in Montenegro, which could be used for financing of energy efficiency projects and ESCOs.

The international financial institution as: EBRD, World Bank, KfW, IFC provide loans through the commercial banks in Montenegro for implementation of energy efficiency projects. These loans could be used for financing of projects on ESCO concept.

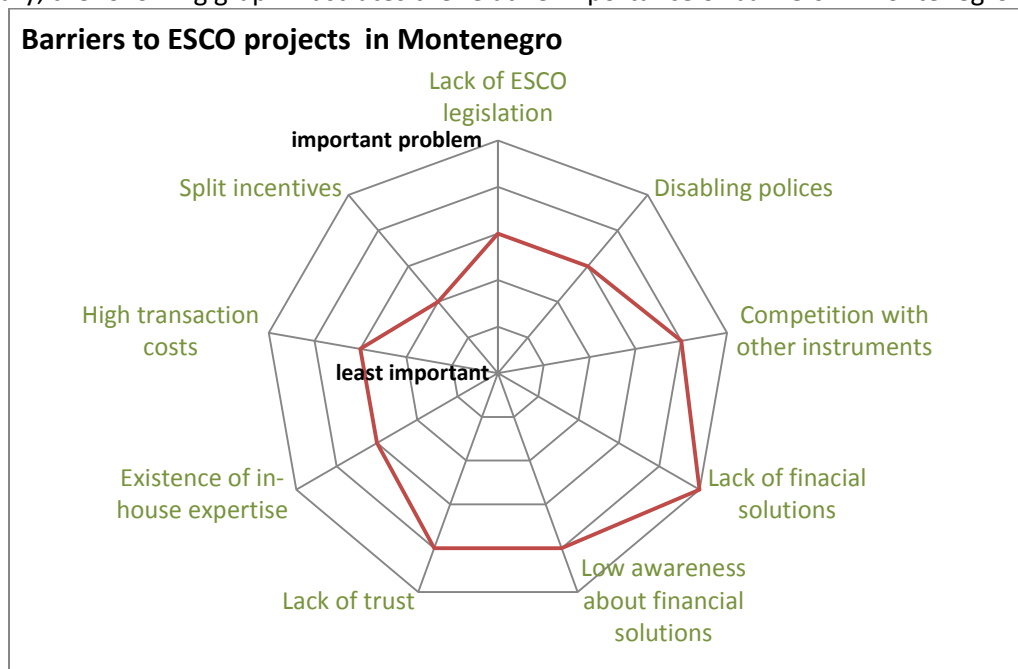
The Ministry of Economy in cooperation with the German KfW Bank launched the "Energy Efficiency Program in Public Buildings" (EPPB) with an amount of 13 million Euros. The agreement with KfW was signed in November 2011 and this program will last until June 2014. The Ministry of Economy is the responsible authority for implementation of the Program. The objective of the program is to improve energy efficiency and to increase comfort conditions in up to 30 buildings, which are under the Ministry of Education and Sports (elementary schools, high schools and special schools, kindergartens and dormitories) (Sekulic 2013).

Barriers

The barriers for implementing the ESCO model in Montenegro are (Nenezic 2012):

- Low awareness for ESCO services and benefit of implementing ESCO model among public authorities (on national and local level) as well as in other sectors (industries, transport etc.);
- Lack of multi annual budgeting for municipalities;
- Lack of supporting financing mechanisms and guarantees;
- Insolvency of municipalities (low credibility);
- Very limited size of ESCO market;
- Risks perceived.

In summary, the following graph illustrates the relative importance of barriers in Montenegro.



Conclusions and future expectations

In order to improve energy efficiency in public buildings and public services the Ministry of Economy is involved in the Regional Energy Efficiency Program for the Western Balkan (REEP), which is supported by European Bank for Reconstruction and Development. The aim of this program is to provide technical

assistance for improvement of legal framework and support of ESCO as instrument for implementation of energy efficiency policies. It will enhance the development of ESCO market in Montenegro.

The programme has already started (July 2013) and will last until 2014. The Ministry of Economy has established a “National Working Group” including other relevant state institutions and the municipal level in order to guide the Project and support the development of an ESCO-enabling legal framework and the formulation of technical guides and templates, which fully reflect the applicable law. Also the programme should develop a model contract for EnPC until April 2014 and should be identified pilot projects for implementing of EnPC model contract (GFA Consulting Group 2013).

Possible break-through points:

- The new Law on Efficient Use of Energy;
- EBRD Regional Energy Efficiency Program for the Western Balkan;
- Development of financial facilities for ESCO;
- Implementation of NEEAPs and local EE action plans;
- Increased awareness raising activity for promoting of ESCO concept.

In the coming period very important factors for development of the ESCO market will be the political will of the government to implement the new Legislation for EE as well as the national and local policies for energy efficiency as (NEEAPs and local action energy efficiency plans). This can initiate the creation and growth of the market for ESCOs.

Montenegro in a snap-shot:

Number of ESCOs	0
ESCO market size and potential	No data
ESCO market trend	0
ESCO association	None
Typical ESCO projects	No ESCO projects
Main type of contract	No contract for ESCO

Serbian ESCO market 2013

The ESCO market in Serbia is still immature, at the same time there are signs of moderate development. While in 2007 ESCOs were not yet present in Serbia, by 2009 isolated actions had already taken place (Marino et al. 2010). Although Serbia does not have extensive experience with the ESCO model, several projects were realised during previous years (EC JRC 2012).

As of 2013, adequate legislation has still not been put forward. At the same time it is expected to be announced that the ESCO business model will be supported in the country. A new Law on Efficient Use of Energy was adopted in March 2013. This sets the legal basis for the introduction of the ESCO model as a solution for the development and implementation of energy efficiency.

Current ESCO market

The potential size of the market for ESCOs in Serbia is still unknown, but it is estimated to be relatively large, both in terms of volume and value. It is connected to the large number of public buildings in

Serbia of various size and complexity. The average energy saving potential is in the range from 25% in public buildings up to 50% in public lighting (Matejic 2013).

Currently only a few (approximately 2-3) firms operate in Serbia that can provide ESCO services. These firms are focused on the industrial sector.(EC JRC 2012). They can provide energy services along the value chain, such as: design, engineering and consulting in project preparation, development and implementation of energy efficiency projects, installation and maintenance of energy efficiency equipment, financial services and project funding.

Some of the foreign companies that have international experience in ESCO services can be involved in the development and implementation of ESCO projects in Serbia, although their core business lies in other areas (e.g. provision of equipment) (Matejic 2013).

Types of ESCO projects

Although the ESCO market in Serbia is not established yet, a few energy efficiency projects have been realised based on an ESCO model in the industrial sector. These are primarily related to the reconstruction of heat supply systems in production facilities, through the replacement of boilers and installation of CHP. These projects are typically concluded based on the BOOT model, and in a few cases based on the shared savings EPC model.

Regulatory factors

The legal basis for the development of the ESCO market in Serbia is the above mentioned new Law on Efficient Use of Energy (Official Gazette 25/2013) adopted in March 2013. The basic principles of the Law on Efficient Use of Energy are (Solujic 2013):

- Energy security (Implementation of EE measures in production, transmission, distribution and energy consumption)
- Competiveness of products and services
- Sustainable use of energy
- Energy management system
- Cost-effectiveness of energy efficiency measures
- Minimum energy efficiency requirements

In particular the following regulations were adopted in relation to Public sector and Local Government Units (Ministry of Energy, Development and Environmental Protection 2010):

- The Law establishes a system of mandatory energy management for municipalities with more than 20,000 inhabitants and for buildings/facilities in public ownership;
- It regulates the obligation of local government authorities to adopt a programme and plan for energy efficiency (including financial sources for realization of programme) and to regularly report to the Ministry of Energy, Development and Environmental Protection.
- It regulates a Budget Fund for the improvement of energy efficiency, which will co-finance activities defined by the Energy Sector Development Strategy for Republic of Serbia until 2015 (OG 35/05) and Strategy Implementation Program 2007-2012 (OG 17/07, OG 73/07 and OG 99/09) of the Republic of Serbia;
- Regulates the right of local government to establish an own budget fund for encouraging and co-financing of activities defined by its program and plan of energy efficiency;
- It encourages the creation of energy audit services to aim at identifying the best energy saving options in buildings, installations and services;

The milk dairy IMLEK from Belgrade concluded with an ESCO from Belgrade an energy service contract. According the concluded contract, the ESCO purchased and installed the CHP in IMLEK and should operate with the CHP plant in the period of 12 years. The IMLEK shall buy on privilege price the total heat production from ESCO, The price of heat is 20% lower than the average costs for heat production in the boiling house operated by IMLEK before. The produced electricity, the ESCO can sell to the responsible entity in Serbia at defined feed in tariff. After 12 years of operation the ownership of the CHP will be transferred to IMLEK. The contract for services is based actually on BOOT model, with some elements for ESCO concept as in the case for delivering of heat to IMLEK

Source: (Economic Consulting Association with KPMG, EIHP, ESG 2012).

Energy service group Ltd. implemented the project in FAD a producer of automotive parts in Gornji Milanovac in 2004. This project was partially based on ESCO model. The financing of the project consisted of two parts: First part regarding the procurement of equipment, was realised in several instalments during implementation and the second part related to development of application software and SCADA system including installation, training and documentation, was paid through the energy savings during the two years of system operation. The Energy Service Group obtained 55% of electricity saving costs during for each month during the two years period. Although, the energy savings was not guaranteed with the contract, the ESCO group over took financial risk for project implementation

Source: (Economic Consulting Association with KPMG, EIHP, ESG 2012)

The Law, furthermore, stipulates in its Art. 67 that “The Minister shall set the format and the structure of a Model Contract for individual types of energy services to be provided” (Ministry of Energy, Development and Environmental Protection 2013).

Pursuant to the Law (Art. 66) energy services shall be provided by legal entities on the basis of “energy service contracts”. Energy services can include: energy auditing, design, construction, reconstruction and retrofit in terms of energy savings, maintenance of buildings, as well as management and monitoring of energy consumption. Provider of energy services as well as the third party takeover completely or partially: commercial, financial and technical risk related to realization of energy services.

The Ministry will take activities for promoting of ESCOs services on the Serbian market (Ministry of Energy, Development and Environmental Protection 2013).

The Law also includes provisions to set up and apply energy efficiency criteria in tendering of goods and services (Solujic 2013).

In November 2011, Serbia adopted a new Law on Public Private Partnership (OG No.88/11) which creates a legal framework for the implementation of all types of Public Private Partnership projects. According to the law public entities may also implement ESCO based projects in several end-uses, such as public lighting, public buildings, and operation in local public utilities (for example district heating companies). (Economic Consulting Association.2012)

The Law on Public Debt does not recognize the subsequent payment obligation within the ESCO projects as a public debt/liability. Pursuant to this Law (Economic Consulting Association with KPMG, EIHP, ESG 2012):

- Public debt is LG's, or other legal entity's, debt for which a government guarantee was issued and activated
- Local government can borrow funds by signing a loan contract or by issuing of securities.

Market factors

The commitment of the Serbian government to energy efficiency in public buildings has increased significantly in recent years, as shown by the supporting legal changes. It is a fact that energy performance status and the overall conditions of schools and hospitals in certain regions of the country need renovation. ESCOs as well as PPPs are considered as the concepts that can provide financial and technical solutions for the situation.

Serbia still enjoys lower tariffs for electricity for households than the EU28 countries. However, the government plans to introduce market priced energy¹³⁷ tariffs for households, industry and service sector as well as to liberalize the market, which will cause increased prices for electricity. The increased prices can be strong factor for the development of ESCOs even in the residential sector (Euractive 2013).

Awareness and trust

The project “Development of performance contracting through pilot projects in the public sector in Serbia” was implemented by GIZ and Ministry of Mining and energy of Serbia in period 2009 -2011.

The Berlin Energy Agency GmbH was engaged as a consultant on the project. Objective of the projects was development of a contract model for EPC and procedures for public procurement of energy services. The proposed EPC was based on the model contract used in Hesse, Germany. The developed model contract was based on the level of energy savings. It is saving guarantee model contract and can be applied in public buildings and in street lighting. This model contract prescribes payment of fixed fee for guaranteed energy savings. In the frame of the project were prepared two pilot projects, but not implemented (Matejic 2013).

¹³⁷ In august 2013 the price of electricity increased by 10.9 % for households and 11.3% for industry and service sector.

Financing ESCO projects

A revolving Fund for Energy Efficiency is planned to be established pursuant to the Law on the Efficient Use of Energy, and promises to be a good source for supporting ESCO projects in the future. The Fund shall be managed by the Ministry in charge for Energy and shall be financed based on an annual programme adopted by the Government. Investment projects to be awarded through open public calls shall pass criteria including an energy audit or feasibility study for energy efficiency. Monitoring of the successful projects shall be based on energy audits performed 12 months after the implementation of the project. (Solujic 2013)

Commercial banks in Serbia are aware of the potential of the ESCO market in Serbia, but have not yet developed their specific products, because they do not have enough information about implementation, operation and funding of ESCO projects. Commercial banks (e.g. Cacanska Bank) mediate credit lines from several International Financial Institutions (EBRD, World Bank, KfW, IFC) for energy efficiency projects in business and retail sector and these funds can be used for financing ESCO projects. Unfortunately commercial banks are not aware of the possibility to finance energy efficiency improvement in the public sector based on ESCO concept (Economic Consulting Association.2012)

The EBRD has developed the Western Balkans Sustainable Energy Financing (WeBSEFF), a €60 million credit line available through local banks in Serbia, BiH, FYROM and Montenegro to help SMEs invest in energy efficiency and renewable energy projects up to €2 million. Through the European Commission, the EBRD has also secured grant funding to provide Investment Incentives to help companies to apply for of this particular facility.

In addition, the EBRD also established a credit line facility window (WeBSEFF II) of €75 million. The credit lines will be extended to local financial institutions for on-lending to small scale energy efficiency and RE projects. This finance is available for the public and private sectors.

WeBSEFF provides financing of up to €2.5 million to municipalities, ESCOs, providers of municipal services and owners of public buildings looking to invest in:

- Modern technologies that cut energy consumption or CO2 emissions by at least 20%
- Retrofitting of buildings, provided the investment will make them at least 30% more energy efficient
- Stand-alone renewable energy projects

The purpose is to help them become them more energy efficient and save on the cost of:

- Providing municipal services, such as transport, utilities and waste management
- Heating and cooling public buildings

Barriers

The major barriers for the development of projects based on the ESCO model are:

- Insufficient capacity of the public sector to identify and prepare ESCO project;
- Not clear ownership over the facilities and not clear defined user/users of the facilities owned by public sector;
- Lack of pilot projects carried out by ESCOs in the public sector;

- Lack of market based financial solutions (direct or through commercial banks). Commercial banks are aware of the ESCO concept, but they do not have specific financial products, probably due to the lack experience in assessing these risks;
- Price of electricity, gas and heat are lower than market prices, although they have been increased in the last two years. Full market liberalization for electricity prices is expected by 2015;
- General lack of trust and unduly resistance towards ESCOs and other PPP concepts because of fear of corruption;
- Lack of experienced ESCO companies and project developers;
- The energy efficiency is perceived as a technical issue only and its financial aspect is not ;
- Lack of reliable energy consumption data that could be used for the establishment of baseline consumption because of: Measurement for heat energy has been performed for several facilities together and not on regular basis in public buildings. The measurement devices are inaccurate and not calibrated. Simultaneous procurement of fuels for several facilities managed by a single public entity/owner (Matejic 2013). Individual metering is not in place in apartment blocks;
- Lack of system for monitoring and verification of energy savings;

In summary, the following graph illustrates the relative importance of barriers in Serbia:



The EBRD in cooperation with the Energy Community launched the project “Regional Energy Efficiency Programme for the Western Balkans” (REEP). EBRD programme consists of (Miller 2013):

- Institutional capacity building/regulatory support and new product development for public sector energy efficiency;
- Credit lines for financing of smaller scale sub projects in public and private sector (including ESCOs);
- Direct financing for medium-sized renewable energy and energy efficiency measures, including for ESCOs

Western Balkan Investment Framework (WBIF) approved grant of € 20 million for EBRD REEP (Miller 2013)

Conclusions and future expectations

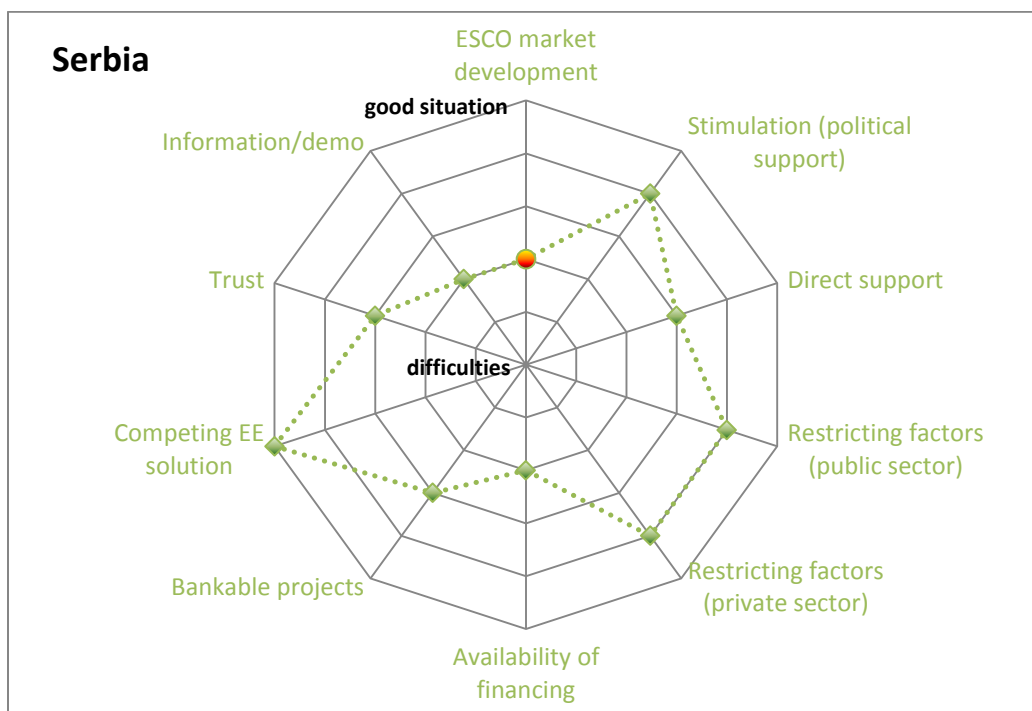
The Serbian public sector shows clear interest to apply the EPC concept in order to improve the energy efficiency performance of public buildings significantly. It is acknowledged that EPC can mobilize private investment in public infrastructure and services without engaging public funds and creating public debt. Implementation of the EPC concept can stimulate economic activities in sectors affected by economic crises (Matejic 2013).

Possible break-through points

- Implementation of the new Law on the Efficient Use of Energy;
- Establishment of a fully operational revolving Energy Efficiency Fund;
- Implementation of local energy efficiency action plans;
- Increased awareness raising activity to promote the ESCO concept;
- Deep involvement of IFIs and numerous ESCO promotion activities.

It is expected that the ESCO market is in front of a major leap in Serbia because of the increased political will of the government indicated also by the adoption of new energy efficiency legislation, and combined with national and local commitments and plans (such as the NEEAP and local action plans).

The following graph shows the key features of the Serbian market:



Serbia in a snap-shot:

Number of ESCOs	2-3 companies that can provide energy services
ESCO market size and potential	no information
ESCO market trend	getting off the ground
ESCO association	none
Typical ESCO projects	rehabilitation of energy supply in industry, on-site power generation (co-generation, micro cogeneration); space heating, air conditioning, control and automation, indoor lighting; refurbishment of building envelope.
Main type of contract	very few EPC or BOOT contracts

Turkish ESCO market 2013

In 2007 the Turkish government adopted the new Energy Efficiency Law, which opens the window for the implementation of the ESCO concept. Since then ESCOs' activity in Turkey has restarted, but when referring to the size of the Turkish market, the ESCO market is not well developed.

Current ESCO market

ESCOs in Turkey are operating under the name of EVD (EVD is a Turkish translation from English of "Energy Efficiency Consulting Company"). According to the Energy Efficiency Law (No. 5627) adopted on 18.04.2007, the companies that provide energy services have to be authorized by the state and must operate under state regulations. The first authorisations (licenses) for ESCOs were officially delivered in May 2011 (Akman, Okay, and Okay 2013).

According to December 2013 data, there are 30 ESCO (EVD) companies operating in Turkey, which are authorised to offer energy services for industry and/or commercial buildings and/or the residential sector. Five companies have authorizations for the industry, 17 for the building sector and 8 for both sectors (Acuner 2013).

The existing ESCOs are distributed in 9 cities only, and most of them are concentrated in Istanbul. Almost all of the prominent industrial centres have organized industrial zones, where most ESCOs are located (Akman, Okay, and Okay 2013).

There is no ESCO association in Turkey. On the state side the General Directorate of Renewable Energy (GDRE) and the Ministry for Energy and Natural Resources (NECC) act as the only facilitators (Akman, Okay, and Okay 2013).

Pursuant to the Energy Efficiency Strategic Paper 2012-2023 the number of ESCO companies for the industry shall be up to 50 until 2015. There is not provision for the number of ESCO companies in the residential sector (Acuner 2013).

The majority of the ESCO companies (75%) are small private enterprises with up to 50 employees. The medium sized enterprises with up to 250 employees are around 25 %. In Turkey there is are no public ESCO companies. Some of ESCOs are established by foreign vendors of energy equipment in Turkey.

These companies have already developed ESCO services in other countries and have experience in the implementation of energy efficiency projects (EC JRC 2012).

Types of ESCO projects

Energy audits, energy certification of buildings as well as the development of energy efficiency projects is actually the core segment of energy services that are provided by ESCO companies (EC JRC 2012).

The majority of the ESCO projects are not based on a full investment grade energy audit. The projects related to the insulation of the building envelope, to indoor lighting, heat waste recovery, HVAC and replacement of electrical motors are frequently covered. The main client beside the industry is commercial sector buildings as: hotels, shopping malls, office buildings (Good, Güven, and Osman Memik 2008).

Hoteliers and international retailers are paying more attention to their energy costs since the hotels and other commercial buildings on the Turkish coast do not have access to natural gas pipelines and they have to pay higher energy prices. Also some headquarters of international companies impose carbon reduction targets, which have prompted Turkish branches to seek the help of ESCOs. The implementation of energy efficiency projects in buildings in the health sector (hospitals) is also reaching a satisfactory level. However schools and education buildings are still not covered by ESCO projects (Good, Güven, and Osman Memik 2008).

The ESCO projects are implemented on the basis of BOOT contracts or on the base of service agreements. EPC has been used only in few cases in pilot projects since they are not fully in line with the Turkish regulations.

Regulatory factors

Turkey as an EU candidate country has overtaken the obligation to transpose and to implement the EU legislation related to Energy Efficiency and environmental protection.

The Energy Efficiency Law (EEL, number 5627) adopted on 18.04.2007 and revised in October 2011 transpose part of the Energy Service Directive (EN 2006/32). This Law is actually the basis for the

In 2012 the first real ESCO project was realized in Turkey with a loan from TURSEFF through the Energy Performance Contract concluded with Johnson Controls (which is an ESCO company) for the oldest shopping mall in Istanbul, Carousel, opened in 1995. The total area of the mall is 75.500 m².

Johnson Controls was selected to design, install and implement the Performance Contracting model to renew the Carousel Shopping Mall's electromechanical systems.

Johnson controls started the project by providing training to the client in performance contracting. After signing a MOU with the client, the energy audit was carried out by a Turkish energy audit team in order to understand the current situation and to assess the gap vis a vis the customer requirements. This enabled a clear definition of solutions and the drafting of list of necessary measures. These were proposed to the customer as a complete and care free solution. Once the customer approved the proposed measures, Johnson Controls carried out the detailed energy audit of the mall. The detailed audit showed the expected result, i.e. that the total energy consumption of the mall could be reduced by 21% with the implementation of the proposed measures. The performance contract includes: cooling system optimization, replacement of heating and cooling pumps, replacement of air handling units and extraction fans, replacement of transformers, roof piping insulation and pump room piping insulation, control system installation. The total investment volume of the project is 3.250.000 USD, the simple payback period is 6,36 years and annual cost saving is 510.518 USD. Management of the "Carousel" mall started discussion about additional measure as lighting system upgrading, operational management of complete building, development of shops energy

definition of energy services and ESCOs. The EEL prescribes also the training of energy managers and energy auditors as well as a procedure for the authorisation of the EVD companies. There are also provisions for financing of energy services through state incentives (Celikoglu 2012).

In July 2012 the Communiqué on the Energy Efficiency Support (CELL) was issued (Serial Number: 2012/3). The CEEL covers the principles and procedures to be enforced on the universities, chambers of mechanical and electrical engineers, and ESCOs in order to ensure a proper execution of energy services in the industrial and in the building sectors. The CELL states that services that can be provided by ESCOs are energy management trainings, energy efficiency projects preparation and implementation, and consulting activities under service contracts concluded with industrial establishments, building owners or building managers (Akman, Okay, and Okay 2013).

Authorization certificates (authorizations) for EVDs are issued by the General Directorate of Renewable Energy. Some criteria for receiving an ESCO authorisation are: to fulfil minimum personal requirements, to hold a Quality management System according to TS EN ISO 9001 and to have facilities, devices and equipment authorised by the Turkish Accreditation Agency.

There are two types of certificates: A and B. The certificates are also separate for the industry and for the building sector. ESCOs applying for a certificate for the industry sector have to fulfil requirements that depend on that industry sector. There are 6 industry sub-sectors and the building sector is divided in two sub-sectors: residential and commercial sector (Acuner 2013).

Pursuant to the CEEL, universities and professionals chambers (mechanical and electrical engineers) can apply for an authorisation from the GDRE in order to carry out training, authorisation and laboratory support to ESCOs as well as for organising training and monitoring for the industry and the building sector. Until this year (2014), the Gazi University is the only institution that has been licenced among 104 universities and the Chambers of Mechanical and of Electrical Engineers (Akman, Okay, and Okay 2013).

Other important legislation concerning energy services and ESCOs include (Acuner 2013):

- Regulation on the Efficient Use of Energy Sources and Energy (En-Ver) adopted in 2008 and revised in 2013.
- Regulation on Building Energy Performance (BEP-TR) (Official Journal Number: 27075 adopted in 2008 and revised 2010).
- Notification on Energy Efficiency Incentives (2012)
- Notification on Authorization of Companies providing energy efficiency services (April 2012 and revised January 2013)

The Turkish government set with the "Energy Efficiency Strategy 2012 -2023" an overall goal of 20% reduction in primary energy intensity by 2023. Several measures are related to the industry sector including: energy audits for industry in order to identify measures for energy efficiency, mandatory energy audits for all enterprises with annual consumption over 5000 toe per year, obligatory establishment of an energy management system according to ISO 50001 for all enterprises with an energy consumption of over 1000 toe per year. It is foreseen that all the activities related to energy audits should be carried out by authorised ESCO companies in the next years (Government of Turkey n.d.).

Market factors

The strategic objective of the Turkish government is to reduce the energy intensity of the country, since the energy intensity of the Turkish economy was 233, 11 kg of oil equivalent per 1000 EUR in 2010, much higher than the average energy intensity of EU27 countries (152,08 kg of oil equivalent per 1000 EUR in the same year). (EUROSTAT 2013)

The Turkish economy experienced a fast recovery after the global financing crisis in 2008. The GDP growth rate according to EUROSTAT was 8,5 % in 2011. It is expected that the primary energy demand will increase around 150% until 2020 as compared to 2013. In the same period the electricity demand will increase annually from 6,7% up to 7,5%. The required investment in the energy sector is estimated at 130 billion USD. Turkey is a country which has also a very high energy dependence of around 70% overall (and of 98% for natural gas) (Celikoglu 2012).

The new Energy Efficiency strategy and the Law on Energy Efficiency create favourable preconditions for the development of an ESCO market. The Turkish government is very aware of the importance of the implementation of energy efficiency measures in the industry and in public buildings, since Turkey has a rapid economic growth (8-9%) and the energy facilities in the country can no longer meet the increase of energy demand. The country is very much depending on the import of oil and natural gas. The state is committed to reduce the energy consumption in order to compensate for the increasing energy consumption.

The driving force for the ESCO market can be the tariffs for natural gas and electricity, which have been increased since 2008. In the period 2012-2013 the prices for electricity increased by 17,7% and for the natural gas by 35,2% in the period 2011-2012 (source EUROSTAT).

Awareness and trust

In February 2008 the Turkish government declared 2008 the "Energy efficiency year" and started the "National Energy Efficiency Movement", the national campaign which purpose is to raise public awareness for energy efficiency. Since 2008 the government has organized seminars, symposiums, conferences etc. In January 2013 in Istanbul the 4th National Energy Efficiency Forum and the Fair took place as part of the Energy Efficiency Week. In particular, this campaign focuses on provinces and municipalities in Turkey in order to initiate the preparation and the implementation of energy efficiency action plans at local level and to improve the cooperation between the public and the private sectors (Celikoglu 2012).

Financing ESCO projects

Energy efficiency funds for the financing of energy efficiency projects do not exist in Turkey. However, the financing can be provided by state budget through incentives (only partially) or by IFIs through commercial banks.

The government has developed two types of incentives schemes for the industry (Celikoglu 2012):

- Incentives for Energy efficiency projects and
- Voluntary agreements for the industry

Pursuant to the Regulation on the Efficient Use of Energy Sources and Energy (En-Ver) adopted in 2008 and revised in October 2011, industrial enterprises can apply for incentives from the state for financing

energy efficiency projects. The project shall have a maximum investment volume of around 378.000 EUR and a payback period of a maximum of 5 years. The state can subsidized up to 30% of the total investment or up to 113.000 EUR of an approved project. Other types of incentives from the state budget are voluntary agreements. Industrial enterprises, which want to apply for incentives from the state, have to sign an agreement with the General Directorate of Renewable Energy (GDRE), according to which they will be obliged to reduce their energy intensity by at least 10% within a period of three years. Twenty percent of the annual energy costs or a maximum of 75.000 EUR will be paid to the companies by the GDRE if they fulfil the voluntary agreement. The companies can finance the purchasing of equipment for co-generation, micro generation and renewable energy through the incentives they receive, but they can also finance services provided by EVD companies for the project's realization. (European Environmental Agency.2011)

In the year 2012 eleven EE projects were approved by the GDRE with a total volume of 600.000 EUR. In 2010 11 voluntary agreements were signed and their results were evaluated during the year 2013.(Acuner.2012)

SMEs can obtain incentives from the Directorate of Small and Medium Scale Industry Development and Support for: the Certification of energy managers (training fees up to 1.300 EUR per person), Energy audits (from 900 to 8.750EUR) as well as consultancy services for energy efficiency (up to 2.200EUR) (Celikoglu 2012).

TurSEEF is a credit line developed by EBRD for SME sized industrial companies and commercial enterprises that wish to invest in energy efficiency or renewable energy projects since the year of 2010. The loans are distributed through the commercial partner banks in Turkey as: AKBANK, Deniz Bank, Garanti, Vakif Bank and Turkey Bankasi. The total amount of the finance facility is 265 million USD. The TurSEEF benefits from USD 50 million in concessional and grant co-financing through the Clean Technology Fund (CTF), combined with about USD 7.5 million in technical cooperation (TC) funding from the EU in collaboration with the Turkish Treasury. The TC funds are used to support the participating banks in developing energy efficiency financing instruments, to help sub-borrowers design and implement such projects, as well as to increase the awareness about the benefits of sustainable energy investments. The maximum loan amount for energy efficiency and renewable energy projects in industry as well as for energy efficiency projects in commercial buildings is 5 million USD. The households also can apply for loans (up to 75.000 EUR) for energy efficiency projects (TURSEEF 2013).

As an example, one of the most important national banks in Turkey - „Seker Bank" develop its own special credit lines entitled „ECO credit" for supporting energy efficiency, waste management and renewable energy projects in small and medium enterprises (SME), individuals, industrial and agriculture enterprises. Until March 2012 almost 320 million TL have been provided for the financing of such projects.

Barriers

Although the Turkish market for ESCO services has a huge potential and the saving potential is large in three sectors: industry, commercial and residential buildings, there are barriers which constrain the development of the market (EC JRC 2012):

- Lack of legislative support for the ESCO business. Procurement procedures are complex and inflexible and specific contractual arrangements for ESCO projects are incompatible with the

national legislation. The current Public Procurement Law prescribes lowest bid prices instead of a "best value" approach.

- The ESCO model is not recognized by the authorities as an individual business model providing services, but as a contract for providing goods. There is no clear definition of EPC contracts and no standard model for EPC contracts. The current ESCO contracts are not based on energy savings.
- Lack of appropriate forms of financing. The commercial banks do not have appropriate portfolios for the financing of projects on ESCO basis, especially in the building sector. They are mainly focused on the industry sector, which has higher priority in the energy efficiency strategy. Commercial banks consider energy efficiency projects for the residential sector as too small and with high risk. ESCO projects are not profitable without state grants. The majority of ESCO companies are small companies with very limited own financial recourse.
- Very limited pull-through projects implemented in SMEs. SMEs request from EVDs only energy audits, and not the implementation of projects based on the ESCO concept. There is tendency toward changing a manufacturing process rather than investing in energy efficiency.
- Lack of trust between clients and ESCO companies.
- Lack of reliable energy consumption data (especially for the building sector) for the set up of a baseline and hence for the provision of reliable data on energy savings.
- Lack of an integrated system for monitoring, evaluation and verification of energy savings.
- Lack of an appropriate promotion of EVDs by public authorities. Very limited number of demonstration projects base on EPC.
- Lack of information and low awareness of the ESCO model particularly among public authorities at local level. Municipalities are not aware about the benefits brought by the implementation of energy efficiency projects as well as about the possibility to use the ESCO model in public buildings (schools, administrative buildings, etc).
- Clients' aversion to sign long terms contracts, due to non predictability of: changing of credit interest rates, changing of inflation rate, fluctuation of Turkish currency and changing of energy tariffs.

In summary, the following graph illustrates the relative importance of barriers in Turkey:



Conclusions and future expectations

The rapid economic growth and the increasing population in Turkey will lead to rising primary energy demand (up to 5% annually) and particularly to increasing electricity demand (from 6,7% up to 7,5% according to the high case scenario) until 2020. The Turkish government is very much aware that the existing energy capacity will not meet the energy demand of the country. Therefore it considers energy efficiency as a very important factor to reduce or to mitigate the growth of energy demand (Celikoglu 2012).

The state must attract more foreign investment projects in renewable energy. ESCOs can take part in the investments and risk. Without foreign capital, with merely the support of international financial institutions, the market will not be able to prosper because it is primarily a risk-based capital system that Turkey is trying to master (Akman, Okay, and Okay 2013).

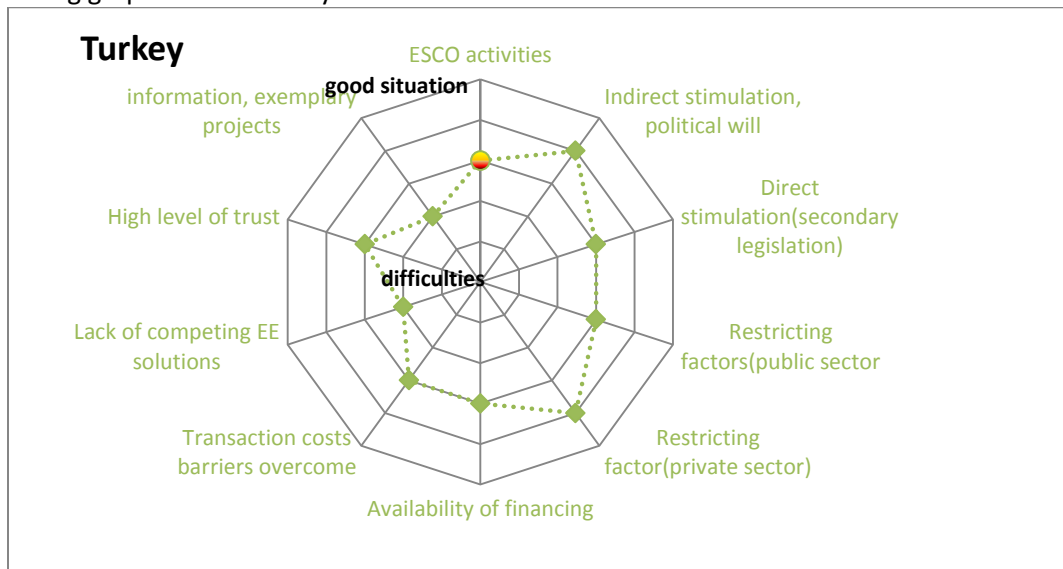
Possible break-through points

- Implementation of energy efficiency programmes and plans
- Performing energy audits to get more reliable data
- Targeted state incentives (reduction of import duties, incentives for the building sector)
- Attracting more foreign investments
- Creation of an association of ESCOs
- Implementation of pilot projects in the public sector based on the ESCO concept
- Increased awareness raising activity

The preparation and implementation of local energy efficiency plans for the municipalities can also initiate the growth of the ESCO business, since there is a large potential for energy savings in public buildings. Information campaigns and the realization of demonstration pilot projects involving ESCOs should contribute to increase awareness.

The creation of an ESCOs association must be encouraged since it can help ease out some of the difficulties by providing unification, recognition, and public awareness (Akman, Okay, and Okay 2013).

The following graph shows the key features of the Turkish market:



Turkey in a snap-shot:

Number of ESCOs	30 EVD companies with state authorization
ESCO market size and potential	no data
ESCO market trend	Getting off the ground
ESCO association	None
Typical ESCO projects	Rehabilitation of energy supply system in the industry, installation on site power generation (co-generation, micro cogeneration); Space heating, air conditioning, control and automation, in door lighting for commercial buildings. Refurbishment of building envelope.
Main type of contract	BOOT, very few EPC contracts

Eastern Europe and Transcaucasia

Armenian ESCO market 2013

The Association of Energy Service Companies of Armenia was established in May 2005 by a group of local ESCOs. The overall mission of the association is to promote the efficient use of energy and expanded use of renewable energy sources as a means of promoting both economic prosperity and environmental protection in Armenia. The association is designed for its members to discuss ideas, information and experience and to share the organizational structure through which ESCOs can raise funds for the implementation of joint projects (Scientific Research Institute of Energy 2007).

Current ESCO market

The “Armenia Building Energy Efficiency Market Assessment” report prepared in the framework of USAID programme “Municipal Network for Energy Efficiency” in 2007, listed 11 ESCO companies that operate on Armenian ESCO market. They are private companies that provide different types of services such as: installation of heating, electric supply systems, HVAC, system maintenance, management consulting, design and planning, energy audits. Some of these private companies supported by the USAID-funded Energy Efficiency Demand Side Management Programme established the Association of Armenian ESCOs (Scientific Research Institute of Energy 2007).

Through the analysis of the needs in promoting EE in Armenia on one hand and the committed assistance from other donors and the World Bank, it can be concluded that some major needs still need to be met, including (Social Impact and Management Systems International 2010):

- Stimulating supply side of local energy efficiency market: production and testing;
- Promotion of energy efficiency in the existing housing stock;
- Conducting innovative projects, which while risky for bank lending, would allow piloting and/or adapting new technologies in Armenia and testing new funding and implementation schemes;
- Continuing capacity building of ESCOs and ESCO association.

The Commercialization of Energy Efficiency Programme (CEEP), financed by USAID, supports the private sector energy service companies and the banking sector to increase the availability of bank financing for energy efficiency projects. However, challenges in developing ESCOs must be recognized and addressed. While it is widely understood that ESCOs need to be developed and supported on their path of becoming true ESCOs and operating with internationally recognized practices, the challenges of doing so should be explicitly recognized, analysed, and solutions sought to support the journey in a stepwise fashion. In particular, introduction of performance based contracting is needed, but this would have to be supported with a pilot, specifically designed schemes, etc. The capacities of ESCOs have significantly increased, most notably with regards to the application of new technologies but also regarding the basics concept of implementing EE projects. However, the program did not attempt to raise them to the next level on their path of becoming true ESCOs, and in particular, to a shift to performance based contracting (Social Impact and Management Systems International 2010).

Trainings, workshops and consultations were provided by the USAID CEEP project (2007 – 2010) to ESCOs on the following topics: proposal writing; project management and monitoring; energy audit techniques/equipment; site selection criteria and principles; principles of EE and CEM for ESCOs and site Energy Managers; practical course on weatherization; and energy economics. Also support was provided

to the ESCO Association (formed in 2005 with USAID support) in the preparation of the newsletters (Social Impact and Management Systems International 2010).

Types of ESCO projects

The World Bank with a US\$1.82 million grant from the Global Environment Facility (GEF) Trust Fund started in March 2012 implementation of the Energy Efficiency Project for Armenia. The project will help to reduce the energy consumption of social and other public facilities. This project will support energy efficiency investments in schools, kindergartens, hospitals, administrative buildings, and street lighting and by reducing energy consumption and CO₂ emissions of retrofitted public and social facilities (World Bank 2012).

To promote the development of the local ESCO industry and ensure sustainability of energy efficiency services within the country, the R2E2 (Renewable Resources and Energy Efficiency Fund) will enter into contracts with construction/ESCO firms. The contracts will include project design and supply, installation, commissioning and possibly maintenance of equipment. In addition, the contract will include provisions to allocate some project performance risks to the contractors based on the actual energy savings generated from the project. Before the start of the project for each type of public building a cost benefit analysis to assess economic and financial viability for energy efficiency investment was carried out. Also energy audits for public buildings were carried out. These analyses showed that energy efficiency investment can create energy saving of 49-52% (World Bank 2012).

Regulatory factors

The Government has taken important steps to encourage realization of the energy efficiency potential. In December 2004, the National Parliament adopted the Law on Energy Savings and Renewable Energy (AL-122), creating a legal basis for energy efficiency in Armenia. This law prescribes energy audit and energy certification but does not include any provisions or definition of energy services and ESCOs (National Assembly of Republic of Armenia 2004).

The Government also adopted the National Program on Energy Savings and Renewable Energy, which identifies the sectors with the largest energy efficiency potential and provides an outline of technical measures/solutions to be taken to realize the identified technically viable potential. Additionally, under the Development Policy Loan (DPL) of the World Bank, the Government adopted a time bound Energy Efficiency Action Plan for 2010-2013 that prioritizes energy efficiency measures for various sectors.

Market factors

The World Bank's Energy Efficiency Study for Armenia (2008) estimated that the public sector can save around 132 billion Armenian Drams (more than US\$360 million), 130 million kWh of energy equivalent annually, and 35% of estimated total energy consumption. The energy audits conducted for eight public facilities as well as energy efficiency investments in eleven schools under the World Bank supported Urban Heating Project, suggest that an average facility could save around 150,000 kWh of energy per year by investing an average of US\$70,000 with payback of three to eight years (World Bank 2012).

Public Buildings in Armenia has significant potential for improvement of energy efficiency and leaving condition. Some of the characteristics of the public buildings are (Babayan 2011):

- Public Agencies –financed from the state or community budgets (hospitals, schools, kindergartens, administrative buildings, street lighting, etc);

- Budget constraints coupled with rising energy costs -gas prices increased ~58% from 2008 to 2010; electricity also increased 20% (daytime), 33% (night-time);
- Buildings are under-occupied, financing is per person (student, patient, etc.);
- Survey results show average comfort levels in social buildings ~40%;
- Energy costs are generally second highest cost (5-20% of total costs) for public buildings;
- State of public buildings is poor and many need rehabilitation without prospects for cost recovery;

Government and Municipalities are aware of the situation and allocate funds from limited sources of the state and municipal budgets to fix situation. IFIs, donors, Diaspora, individuals support implementation of projects for improvement of the living condition and comfort. However, the financing of the energy efficiency measure cannot be provided since the granted funds are limited and loans are not provided for this type of organizations. Implementation of energy efficiency projects on ESCO concept shall be a solution (Babayan 2011).

Awareness and trust

The concept of the “Outreach Plan” was developed in 2009 in framework of USAID CEEP. Main components of the plan were: production of Project Bulletins and success stories; production of ESCO Association Newsletter; program presentations and media events; and promoting general energy awareness. In practice: The website, brochures, project bulletins, success stories, ESCO Association newsletters were prepared as planned. They were disseminated during the program events, during the various business expos, and public events (Social Impact and Management Systems International 2010).

Financing ESCO projects

Renewable Resources and Energy Efficiency Fund (R2E2) was established by the Government Decree No799N of 28 April 2005 following the Law on Energy Savings and Renewable Energies. Objective of the fund is to create financing mechanisms for energy efficiency and renewable energies. The fund is an independent legal entity acting under civil code (Babayan 2011).

The Fund shall implement the following activities (R2E2 2013):

- Training and capacity building for private entrepreneurs and auditors, energy service companies (ESCO), financial institutions (FI) and home owner associations (HOA) and capacity building related to renewable resources and energy efficiency sector investments;
- Awareness campaign on renewable resources and energy efficiency new technologies;
- Organization of credit and loan projects in renewable resources and energy efficiency sectors pursuant to respective international contracts and authorities given by the Government of the Armenia;
- Organization of financing in renewable resources and energy efficiency sectors;
- Financing of residential and industrial energy efficiency projects;
- Financing of renewable resources and energy efficiency projects through credits and grants;

The R2E2 Fund will be responsible for implementation of the financial management function of the World Bank Energy Efficiency project, including the flow of funds, planning and budgeting, accounting, financial reporting, internal controls and auditing.

In July 2007 EBRD started the Caucasus Energy Efficiency Programme, a dedicated credit line facility for EE and RE projects in Georgia, Armenia and Azerbaijan aimed at end-users in the industrial sector, RE

sources developers and end-users in the residential sector. Under this Programme, the EBRD launched the US\$35 million Georgia Energy Efficiency Programme at the end of 2007 and plans to launch a similar USD 20 million programme in Armenia: the Armenian Sustainable Energy Finance Facility (“ArmSEFF”) for industrial energy efficiency and renewable energy efficiency. An additional US\$5 million, in local currency may be extended for residential energy efficiency, subject to local currency funding availability.

Barriers

Barriers for ESCO mechanism in Armenia (Babayan 2011):

- Low awareness on benefits
- Lack of capacity for assessment of the energy efficiency potential
- Lack of working capital in private construction companies
- Lack of long term loans within financial market
- Lack of mutual trust between contractor and client
- Risks related to the changes of behaviour after improvement
- Energy tariff non predictable, weather is changed from year to year
- The obligation in public organizations to go through a conventional tender process is a major barrier

Trainings, workshops and consultations to 6-8 banks in risk evaluation/ assessment of EE proposals/projects were conducted in framework of USAID Commercialization of Energy Efficiency Programme (CEEP). The training for bankers were shifted from a workshop mode to one-to-one training of bankers mid-project which resulted in training less number of people than planned (Social Impact and Management Systems International 2010).

In summary, the following graph illustrates the relative importance of barriers in Armenia:



Conclusions and future expectations

The Armenian Market is much more developed for energy services compare to the markets of others South Eastern Countries. There are several ESCO companies that operate on the market, but they are still weak in terms of capacity and financial abilities.

Possible break-through points

- Implementation of World Bank “Energy Efficiency Project”;
- Development of legislation for ESCO and improvement of public procurement legislation;
- Implementation of pilot projects in Public sector on ESCO concept;
- Improvement of capacity of R2E2 Fund;
- Increased awareness raising activity to promote the ESCO concept.

Technical assistance is a component of the World Bank's “Energy Efficiency Project”. It will help to remove the existing barriers to realize the energy efficiency potential and to create an enabling environment for energy efficiency in the public sector. The key areas that this component will finance include: capacity building of the R2E2 Fund (Renewable Resources and Energy Efficiency Fund), including training and basic audit and monitoring equipment; pipeline development and capacity building for public agencies involved addressing knowledge gaps on energy efficiency, building the demand for program financing, and improving the prospects for the sustainability of energy savings generated under the project; policy development support, including efforts to support budgeting, procurement and financing of energy efficiency projects in the public sector as well as selecting policy measures and energy statistics; market development and capacity building of various market actors, including Energy Service Company (ESCOs), banks, construction firms; and project management, including monitoring, reporting and financial audits (World Bank 2012).

Armenia in a snap-shot:

Number of ESCOs	11
ESCO market size and potential	no information
ESCO market trend	slightly increase
ESCO association	1 (Association of Energy Service Companies of Armenia)
Typical ESCO projects	rehabilitation of heating supply system for public sector; indoor lighting; street lighting; refurbishment of building envelope;
Main type of contract	very few EPC or BOOT contracts

Belarus ESCO market 2013

There is no specific legislation in place in Belarus, which regulates the energy services. However there are several companies which provide energy services on the basis of existing legislation. The ESCO activities will be regulated with the new Law on Electricity or with the new Law on Energy Savings that are under approval.

Current ESCO market

The first ESCO in Belarus (BelinvestESCO) was established by Belinvestbank and the Department for Energy Efficiency of the State Committee for Standardization in 2005. Currently, several energy service companies are operating: BelinvestESCO, “Conecticum”, ENECA and Vneshenergiservice. These ESCOs provide energy services on contracts which are similar to the ESCO model. Most of the implemented projects involve improvements or reconstructions of heat energy supply systems and networks since the potential for energy savings in this sector are large due to the old equipment, the installation and the

huge energy losses. The energy supplier systems are mostly state owned (UN Economic Commission for Europe 2013).

Within the framework of UNDP/GEF Project: "Removing Barriers for Energy Efficiency Investment", in September 2010, the "International Energy Centre (IEC)" was established. The aim of IEC is to promote energy efficiency projects and financial schemes (including testing of new schemes e.g.: ESCO), to support energy efficiency investments project pipeline and to share know how and experience among all relevant stake holders. The IEC was integrated into the structure of BelinvestEnergoSberzheniy" and has been supervised by the Energy Efficiency Department of the State Committee for Standardisation, which is a responsible authority for implementation of energy efficiency programmes. Today IEC operates as engineering and consultancy of companies, experienced in development, investment, performing and monitoring of energy efficiency projects. IEC implemented projects on the basis of Simple Partnership Agreement (SPA), which are similar to the contracts for Energy services (UNDP 2011).

Types of ESCO projects

The first ESCO projects in Belarus were established for energy supply and were implemented on turnkey basis using UK Energy Management contracts as a contract model. The ESCOs develop, install, maintain, and operate energy installation (boiler houses, CHPs etc). They owned the installation during the project (contract) time frame and sell the energy (heat or electricity) at lower prices compared to other suppliers. After the end of contracts the ownership of equipment is handed over to the client (state body). On the same model, energy efficiency projects realised by IEC, using SPA contract have been implemented. This type of contract is similar to the build –own-operate-transfer (BOOT) contract. The ESCOs uses mainly loans or long lease provided by foreign banks through the ESCOs, and guaranteed by local bank or EU stakeholders (UN Economic Commission for Europe 2013)

The ESCO's contract with its clients are different from the standard contracts where conventionally goods or services are provided by one party to the other in the form of a payment. Some of the specific differences are (Iqbal and Yozhikov 2006):

- An ESCO provides a basket of services to the customer, under a performance guarantee. Performance however, can be defined in a multitude of ways. The client may not actually pay for the services in the conventional manner.
- Instead, in some cases it is the ESCO who may actually make a net payment to its customer as a percentage of the savings it creates, whilst at the same time providing the customer its basket of services.
- ESCO services often include procurement/provision of funds, and provision of performance guarantees. In certain cases, an ESCO organises the finance from banks/financing institutions for its customer, whilst in other cases the ESCO itself operates as a financing institution.
- ESCO guarantees its clients (and the investors) that their investment will be fully paid back within the term of the contract.

In the framework of UNDP/GEF project "Removing barriers to energy efficiency improvement in the state sector in Belarus", several energy efficiency pilot projects in Belarus had been implemented. The realized projects included: construction of mini CHP, replacement of boilers and burners, replacement of heat pumps, installation of controlling and monitoring devices at boiler houses, installation of heat recuperation systems, construction of waste utilizers etc. In all instances energy audits and prepared pre-investment studies were carried out. The financing was ensured through own equity of clients (for

lower budget projects) or through commercial banks and state loans for the larger projects (Grebenkov and Molochka 2013).

Within the framework of this project, ten training for energy auditors (350-400 attendees) were carried out. Furthermore, bankable proposals and loan application for public entities were prepared, 27 investors for state owned entities were attracted and several pilot projects were realized. Also the ESCO was introduced as one of one of possible financial scheme for implementing energy efficiency projects.

Regulatory factors

Although there are few energy service companies operating in Belarus, there is no specific legislation regulating energy services and ESCOs. The major legal acts that regulate the Energy savings and energy efficiency are: (ENECA.2013):

- Law on energy savings No.190-3 of 15 June 1998;
- Resolution of the Council of Ministers of the Republic of Belarus “On lax crediting of energy efficient and currency repaid project №720/14 of 31 May 2002”;
- Resolution of the Council of Ministers of the Republic of Belarus “On procedure of energy audits implementation” №964 of 29 July 2006;
- Resolution of the Council of Ministers of the Republic of Belarus №1882 of 24 December, 2010 “National Program on energy savings for the 2011-2015 period”.

The objective of this program is reducing in the energy intensity of national GDP (from the 2005 level) by 50% until 2015 and 60% by 2020. To increase up to 28%-30% the share of domestic energy resources in the boiler and furnace fuel mix in 2015 and up to 32-34% in 2020 (Energy Charter Secretariat 2013b).

The National Program includes a list of measures in all sectors: Industry, residential, commercial and public sectors. The measures to be implemented in the industry sector will be focused on upgrading or replacement of industrial process based on old inefficient energy technologies. In housing and public (municipality) sector should be undertaken projects related to reconstruction of heating production and distribution systems, installation of mini CHP plants on local fuels (biomass in most of cases) improvement of outdoor and indoor lighting systems (street lighting). At the same time, energy efficiency of buildings should be increased and in 2015, the proportion of the energy efficiency homes shall reach 60% (Council of Ministers 2011).

The Civil Code suggests a variety of ways for starting and running a company. The following are a few of the legally approved organisational formats for commercial entities (Iqbal and Yozhikov 2006):

- Shareholding companies;
- Societies;
- Production co-operatives;
- One owner companies.

All these types of companies can be owned by the government or privately owned.

Market factors

Through the implementation of the energy savings policies and strategies, the maximum use of local energy resources and the use of renewable energy, the government want to ensure energy security as well as decreasing energy dependency of the country. Almost 99% of the natural gas is imported and it represents 63% of primary energy consumption in the country (Energy Charter Secretariat 2013b).

From 2006–2011, the cost of natural gas imported to Belarus increased by more than a factor of five; this caused an increase in energy prices and tariffs for the consumers. In 2011, from January to September, on a year-to-year basis, prices for imported energy denominated in US Dollars increased by 17.4% on average, specifically by 36.5% for gas; by 10.2% for oil and by 9.3% for oil products (Energy Charter Secretariat 2013b).

The willingness of state to reduce energy dependence of Belarus for natural gas as well as the increasing prices of natural gas provided by Russia can be a driving force for the development of energy services in the country.

Once the ESCO concept is established and proven, the real impetus in the growth of the ESCO sector, will inevitably involve the participation of foreign investors, foreign ESCOs, and foreign technology. This however cannot happen unless the Ownership & Operational rights of foreigners and the repatriation of profits by foreign companies can be safeguarded. The Belarusian Government actively welcomes foreign investment and foreign technology and the issues of safeguards are well spelt out in Belarusian legislation. A large number of successful foreign investment projects are now in progress (Iqbal and Yozhikov 2006).

Awareness and trust

Several pilot projects implemented with a technical support of international organization (UNDP) have shown the benefit of implementation of projects through ESCO model. They were implemented in more than 17 cities in Belarus and are used to promote energy services for public sector and industry based on ESCO or SPA model. As a result, their implementation had also contributed to increase the knowledge on energy savings, financing and development of energy efficiency projects of public institution and public entities (UNDP 2011).

Financing ESCO projects

Sources for financing of energy efficiency projects in Belarus are: own funds of enterprises, National fund for Energy Efficiency (NEF), Ministry of Energy Innovation Fund, Belenergo Concern Innovation Fund of and other innovation funds and local budgets.

In general the innovation funds can utilize a mix of grants and concessional financing to improve energy efficiency. In the case of Belenergo Innovation Fund, the grants can be used for financing energy efficiency projects in state sector, while the concession financing can be allocated for public as well as for private sector. The loans are given for 3 to 5 years period but if the inflation rate stays on lower level for longer period, loans can be provided for a longer lending period. Business plans and implementation agreements are required by the banks, but no security or other documents are required. Since the Belenergo Concern is state owned company, the Investment Fund has been managed by the Committee on Energy Efficiency. The state stipulate each year the percentage of enterprise fund that should go to the Innovation fund (UNDP 2011).

The funds from the National Energy efficiency Fund (NEF) have been used for financing of innovative energy efficient measures in state enterprises and budgetary organization and may be taken in form of guarantees for loans from commercial banks offering concessional loans. The planned allocation are agreed with Ministry of Finance and approved by the head of NEF committee. The income of the NEF comes from fines and penalty of enterprises, local government which do not fulfil their obligation for energy savings agreed with the Committee on Energy Efficiency. The enterprises for financing of priority energy efficiency measures can use subsidized loans from commercial banks at half of the National Bank

discount rate. The guarantees for 50% of the loan are taken by the Government through the NEF. However, those funds are still underused by the enterprises (UNDP 2011).

In principle, banks are prepared to consider energy projects, because competition for good borrowers is increasing. However, at the moment provision of loans to companies is based on overall assessment of their assets. Banks know almost nothing about international project financing (Iqbal and Yozhikov 2006).

Barriers

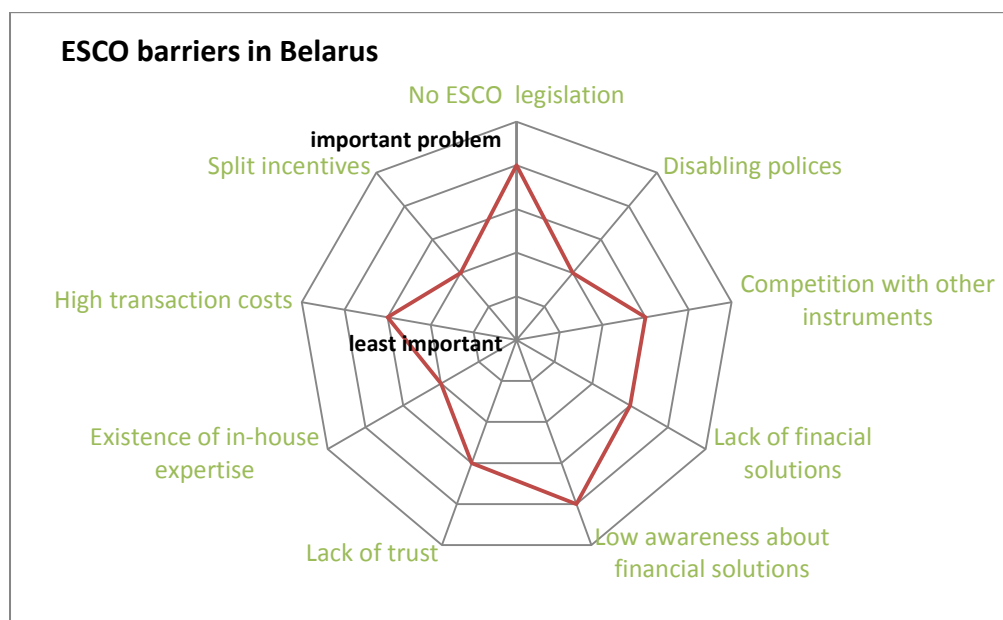
Lack of legislation on energy services (ESCOs), regulation for heat supply and CHP as well as the lacking of energy efficiency regulation (standards and norms), constrain the development of market for energy services in Belarus (UN Economic Commission for Europe 2013).

Lack of financing through commercial banks is another barrier towards the development of ESCO. The commercial banks are not interested for the development of financial products for energy efficiency, because of the lack of knowledge and experience in energy efficiency investment cycle. The enterprises have not sufficient capacity to develop feasibility studies and business plans for applying to bankable projects, even if they are guaranteed by states funds (Grebenkov and Molochka 2013).

The Lack of motivation for implementing energy efficiency measures in supply side is due to the unclear transparency of financial flows, unfair energy tariffs for independent producers and high level of centralization. The demand side is also not motivated, due to the minor experience in energy management. As a result, a financial saving model generated by energy savings cannot be applied in budgetary organization and under cross-subsidizing system. Energy norms are established on a basis of the achieved level and grant funding does not provide motivation for other EE investments (Grebenkov and Molochka 2013).

The interest rate for loans provided by commercial banks are also very high (up to 35-36%) and for all legal entities interested in investment in energy efficiency measures can be offered finance at an interest rate not exceeding 50% of the National Bank Rate.

In summary, the following graph illustrates the relative importance of barriers in Belarus:



Conclusions and future expectations

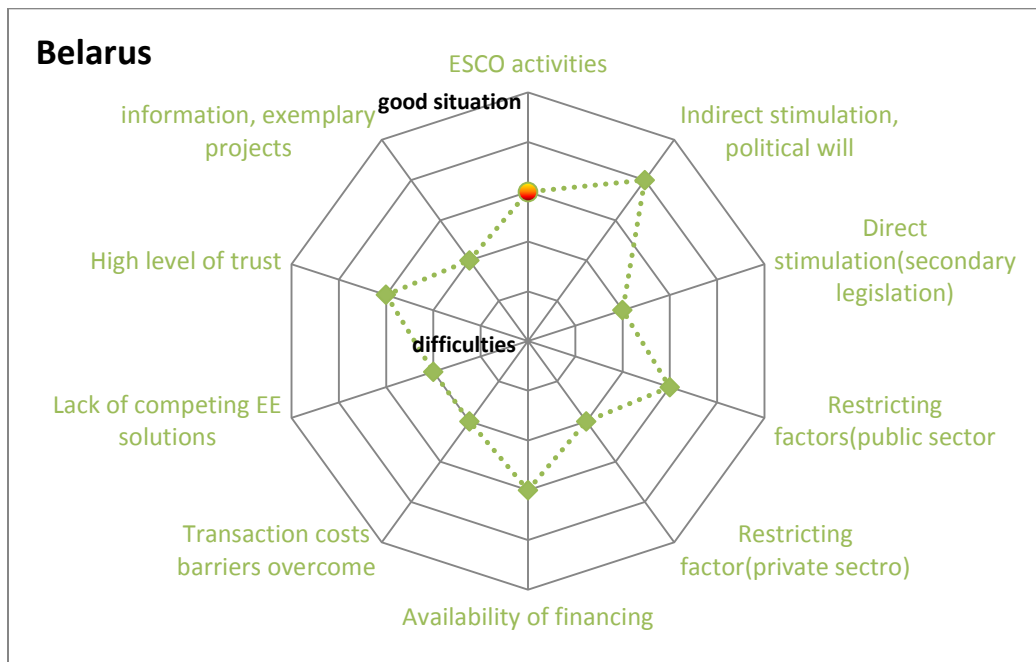
The preparation and adoption of energy efficiency legislation as well as the legislation which will regulate energy services together with the development of contracts for energy services should be the driving market factors for the ESCO market's development in Belarus. The International Energy Centre should be supporting the promotion of financing schemes for energy efficiency including the ESCO model. The IEC should also help in organizing training for energy auditors and in-house experts for the preparation of bankable projects for energy efficiency.

Possible break-through points

- Political will to reduce energy dependence and energy intensity;
- The new Law on Electricity and new Law on Energy Savings;
- Review of state incentives (grants) for EE;
- Covenant of Mayors Initiative;
- Increased awareness raising activity.

There are 6 municipalities from Belarus that already signed the Covenant of Mayors initiative. The European programmes and organisations can support the preparation and development of their SEAPs. Within the framework of these activities, trainings for local experts on different topics, e.g.: energy audits, development of investment projects, energy management for public buildings and industry, can be organized.

The following graph shows the key features of the Belorussian market:



Belarus in a snap-shot:

Number of ESCOs	3-4 companies
ESCO market size and potential	n/a
ESCO market trend	increasing since 2012
ESCO association	none
Typical ESCO projects	Heating supply systems reconstruction ; improvement of heating system in public buildings public lighting
Main type of contract	Simple Partnership Agreement (SPA) similar to BOOT contract

Georgian ESCO market 2013

The ESCO market in Georgia is not developed because of the lack of supporting legislation and interest for investment in energy efficiency project implemented on ESCO concept. However, the municipalities in Georgia became more and more interested in energy efficiency issues. Six municipalities including the capital city Tbilisi already signed the Covenant of Mayors Initiative and started with implementation of energy efficiency polices.

Current ESCO market

They are no ESCO companies operating on the Georgian energy market. The lack of know – how for energy services and low knowledge for energy efficiency in general, are the factors which constrain development of ESCOs. In last few years with the support of foreign donor organizations projects have been implemented related to capacity buildings and training for local experts and local administration regarding energy efficiency issues.

In the frame work of the Georgian –Norwegian Capacity Building Programme on Energy Efficiency in 2003 was established the Energy Efficiency and Cleaner Production Centre, a non–governmental and non-profit organization, which mission have been to enhance activity of the engineering staff of Georgian enterprises in the direction of saving resources and as a result to reduce waste and decrease environmental pollution. The program included two sub-programs (Energy Efficiency and Cleaner Production Centre 2013):

- Energy Efficiency in Buildings (EAB);
- Municipal Energy Efficiency Planning (MEEP).

The overall aim of the sub-project: "Energy Efficiency in Buildings" is to contribute to increased energy efficiency in private and public buildings and facilities in Georgia.

The main activities were (Energy Efficiency and Cleaner Production Centre 2013):

- Updating/Development of manuals and tools. The latest version of Energy Savings International (ENSI) manuals, tools and software for energy auditing of buildings were updated and translated. Energy Auditing of Building Software (EAB) Textbook was updated, translated and published;
- Training. The local EAB Team (in total 10 persons) were trained on updated and new methods, tools and software for energy efficiency in buildings and energy auditing;

In 2007 the MEEP program prepared baseline evaluations for municipal energy consumption in buildings and drafted the first version of the Municipal Energy Efficiency Plan. In July 2008, the final draft of Municipal Energy Efficiency Plan for Tbilisi City was completed and presented to City Administration. The Municipal Energy Efficiency Plan is an important tool for municipal decision-makers, authorities and developers when planning for renovation and upgrading of municipal facilities by allowing them to target the most energy consuming objects and make action plans accordingly. (Energy Efficiency and Cleaner Production Centre 2013)

Types of ESCO projects

They are no example of energy saving or energy efficiency projects implemented on the basis of ESCO concept in Georgia.

Regulatory factors

Energy services and ESCOs are not regulated by the Georgian legislation. The legislation related to energy efficiency also has been not adopted.

Work on the drafting of an energy efficiency law was well-advanced before it was abandoned by the government in 2008. At the time of writing the Ministry of Energy has no formal sustainable energy or energy efficiency executive agency within its responsibility or budget provision for the implementation of sustainable energy programmes. Nor is there any provision for such in the “Priorities for Government 2009-2012”. (Energy Charter Secretariat 2012)

Winrock International – a USAID subcontractor – has worked with the government authorities since 2007 and a draft for an Energy Efficiency Law was developed with the cooperation of the Ministry of Energy and the NGO, “World Experience for Georgia” (WEG). The law was ready to go before the Parliament of Georgia in the autumn of 2008. (Energy Charter Secretariat 2012)

The Georgian Policy and Legal Advice Centre (GEPLAC), financed by the EU, has assisted the government on energy policy and legislation, most recently in the preparation of a law on energy efficiency. (Energy Charter Secretariat 2012)

Market factors

Georgia imports 98% of its primary energy requirements of natural gas and oil products, which together meet about two thirds of the primary energy supply. Because of this and the relatively high energy intensity of its GDP, the competitiveness of Georgia’s economy is particularly affected at times of high energy prices. (Energy Charter Secretariat. 2012)

Reducing of the Energy dependence and energy intensity of the Country are strategic aims of the government. Energy efficiency can decrease the energy dependence and shall contribute to straightening of Georgian economy. Implementation of projects based on the ESCO concept can be a possible model for financing of EE.

Information, awareness and demonstration

Local representative from the municipal sector, industry and decision-makers often lack of information on the practical options for energy efficiency that will influence their business in positive way. (Energy Efficiency and Cleaner Production Centre.2013)

In the framework of the Georgian –Norwegian Capacity Building Programme on Energy Efficiency materials (project brochures, guidelines, reports) of the implemented projects had been disseminated.

- A Demonstration project was implemented in the Khidistavi School (located near Gori). Installation of the heating system and PVC double glazed windows in the classrooms and Renewable Power Source (wind power generator 400 W and PV system 125 W) had been carried out.

- Dissemination/Experience sharing. A dissemination seminar was organized where project results were shared with local stakeholders, governmental representatives and international organizations.

Financing ESCO projects

There are no special funds or financial products developed by local commercial bank for financing of ESCOs in Georgia.

The one example for financing of energy efficiency project has been the Revolving Fund (RF) established by Georgian–Norwegian Capacity Building Programme. This fund financed through small loans energy efficiency measures in private production companies (milk or bread factories). The maximum loan taken by companies was 7,000 USD.

Barriers

The barriers for development of ESCO market in Georgia are:

- Lack of legislation for ESCO ;
- Lack of public procurement regulation for procurement of energy services;
- Lack of financial products provided by banks for energy efficiency projects and ESCOs;
- Lack of know-how and experience for energy services and ESCO among all relevant stake holders: National and local authorities, business sector, financial institutions and experts community;
- Lack of demonstration projects implemented on ESCO concept;

Conclusions and future expectations

Development and implementation of energy efficiency legislation including the regulation for ESCO can create condition for implementation of projects based on ESCO concept. The government also shall introduce incentives in order to stimulate the local and foreign companies to invest in ESCO projects.

In the same time the international organization shall be involved in capacity building of local energy experts in public and business sector as well as in development of procedures and templates for EPC and public procurement for energy services. Capacity building for experts for preparation of financial products for EE can be also organized through international organization.

Promotion of energy services and ESCO especially on local level through campaigns supported by government can also raise the awareness of local authorities for energy services and ESCOs. In the last three years six Municipalities of Georgia (including the capitol city –Tbilisi) signed the Covenant of Mayors initiative, and submitted SEAPs.

Moldovan ESCO market 2013

The Moldovan ESCO market is still on the ground because of the absence of legislation, which is necessary to accept a common definition and regulation of the energy services and ESCO market.

Current ESCO market

There are few engineering companies in Moldova that can provide some kind of energy services : consulting, design and construction of ecological and energy efficient houses, design and installation of heating and ventilation systems, installation of heating /cooling systems with heat pumps, installation and maintenance of equipment etc. These companies are working on donor financed turnkey contracts. Few of them can also provide energy audit for buildings (UN Economic Commission for Europe 2013).

In the absence of own funds, the involvement of third parties in the implementation of energy efficiency measures and, consequently, development of energy services market, has become a primary task (Government of Moldova 2013).

The Moldovan Energy Efficiency Agency which was established in December 2010 has been responsible for implementation of national energy efficiency policies and was appointed as implementation body for the NEEAPS Measure "Promotion of Energy Services".

The Agency has started the process of drafting the normative framework with the first step – studying the energy services market and the barriers to be eliminated in order to develop it, having benefited from the SYNENERGY Programme (Government of Moldova 2013).

During the period 2013-2015, the development of energy services market would impose a series of actions detailed below (Government of Moldova 2013):

1. Setting the legal and normative framework:

- developing and adopting the Regulation on energy services companies;
- amending the existing legal and normative framework to eliminate the administrative and financial barriers;

2. The Agency will develop the following supporting tools for the potential energy service providers and recipients:

- a) Handbook comprising the main features of the Energy Performance Contract;
- b) Energy Performance Contract sample/template;
- c) Practical guidelines for implementing an energy management system.

3. In order to stimulate the energy services market, the Agency will take the following measures:

- a) devising a study to identify the potential tax incentives and customs facilities, having conducted cost-benefit analysis;
- b) amending the relevant legal framework to introduce the tax incentives and customs facilities.

Pursuant to the first NEEAP, ESCO model for financing of EE can be applied also for renovation of public buildings and for improvement of street lighting in municipalities of Moldova. However, it is needed preparation and adoption of legislation related to energy performance of buildings, public procurement and public budget (Government of Moldova 2013).

Types of ESCO projects

The Moldavian industrial sector has recorded substantial energy losses due to poor energy management, limited awareness and poor know-how about energy efficiency, inefficient exploitation, poor maintenance, inadequate procurement procedures, using old technologies etc. Therefore pursuant to the first NEEAP one of the measures which should be implemented is related to Development of energy service market for industrial sector. ESCOs should be in charge for implementation of Energy management systems in industry sector according the ISO EN 50001, energy audits and training of in house experts. Moldavian ESCOs have to be provided with training and expertise by international experts in order to be able to provide energy services to industry sector. (Government of Moldova 2013).

The optimising of heat production and distribution will be one of the priorities of the Moldavian Government for the next period of time (until 2020). The target is to reduce the heat losses up to 12% until 2020. This target should be achieved through making the heat production more efficient and through improvement of quality of the heat supply. The project will be related to upgrading and reconstruction of heat distribution networks, upgrading or reconstruction of pump stations, installation of monitoring and controlling devices, replace of thermal insulation of heat distribution systems.

Regulatory factors

The National Development Strategy "Moldova -2020" was approved by the Law No.166 in July 2012. This strategy outlines the midterm and long-term indicative targets to reduce of the energy intensity of Moldavian industry of 10% by the year 2020. In the electricity sector (transmission and distribution) it is proposed to cut losses with 13% by 2015 and with 11% by 2020. The energy use within buildings is expected to be lowered with 10% by 2020 (Government of Moldova 2013).

Similar to the aforementioned Strategies, this Programme, approved by Government Decision No. 833 dated 10 November 2011, stipulates the reduction of greenhouse gas emissions with 25% in comparison with the level recorded in 1990. Also, the Programme lays down the national objective to make the overall use of primary energy more efficient by 20% by 2020. The Programme comprises measures to be taken in all national economy sectors, which, in fact, reflect the requirements set by the European Directives on energy efficiency and renewable energy sources, including creation of energy services market. (Government of Moldova 2013)

The first National Energy Efficiency Plan for 2013 – 2015 was adopted in February 2013. The overall national indicative target set by the Moldavian Government is a reduction of energy consumption by 9% until 2016. (Government of Moldova 2013)

There are several measurers in the first NEEAP regarding the promotion of energy services and development of ESCOs as follows (Government of Moldova 2013):

- Promotion of energy service companies (ESCs). The final goal is setting legislation and regulatory frame work to involve third party in the sector and set forth energy services. For the purpose of this measure the following actions will be taken:

1. Drafting the regulation on energy services companies would ensure the conditions for their operation on the market:

ESCOs would have the mission to guarantee financing, and to secure more advanced maintenance and operation level for energy systems;

In the private sector, these services would secure the quality of implemented projects, proper operation and maintenance of energy systems;

In the public sector, the ESCOs interventions would contribute to the reduction of energy losses in the lighting system, in the heating supply networks, within buildings, etc.

2. Drafting the package of documents necessary for the conclusion of energy performance contract (contract template; additional necessary acts).

3. Identifying and notifying the potential recipients of services about the stages and advantages of energy performance contracts.

4. Training and advising the potential energy services providers (building companies; design firms; entities dealing with manufacturing and installation of efficient technologies, etc.). This action will be focused on clarifying the energy performance contract procedures and contents, etc.

5. Suggesting amendments to the legal framework in place related to public procurement procedures and Local Public Authorities financing to overcome the barriers to ESCO market development. The purpose of this action is to allow financing the energy efficiency measures at the account of energy savings, and to pick up technologies and materials based on price-quality.

Development of energy services market for the industrial sector. Expanding and strengthening the quality of energy services rendered to the industrial sector and to other sectors on the Moldovan market. Supporting the development of the national services market and energy products for the industrial sector. The measure will envisage the following activities:

1. trainings for national experts, including on-the-job trainings with the involvement of international experts;

2. technical assistance provided to undertakings by national experts who successfully completed the training courses organized by UNIDO Programme.

The Implementation bodies for this measure are: Ministry of Environmental, UNIDO, national experts and energy service providers.

Market factors

Besides the state's policies and willingness of the Government to support energy efficiency programmes, the very important market factors in Moldova should be increasing of prices of the electricity and natural gas as well as an introduction of heat energy consumption metering in residential sector, which has been foreseen with the Energy Efficiency Programme of the Government. The tariffs of electricity and natural gas are still under the EU average and they are subsidized by the state. However, in last few years they have been increased and it is expecting that will be much higher after liberalization of electricity market which is an obligation that Moldova has taken after entering in European Community Treaty. The tariffs are equal for industry and for residential sector, so both sectors will be motivated to undertake energy efficiency projects and to reduce energy costs.

Awareness and trust

In order to guarantee a functional energy services market, the Agency will conduct awareness-raising and training actions intended for the market main actors. This measure implies professional education and training of energy service providers, consultants and recipients, as well as the implementation of the following activities (Government of Moldova 2013):

- a) setting help-desk services by the AEE, which will provide guidance and assistance, upon case, to the market actors in the process of preparing and devising the energy performance contracts;
- b) developing a Handbook for the public sector and organizing training sessions for Local Public Authorities;
- c) training the Energy Managers in charge with LEEPs (Local Energy Efficiency Plans) and LEEAPs development;
- d) raising awareness and training the private sector;
- e) providing training on tools relating to energy management systems and optimising the steam systems;
- f) drafting a Handbook regarding the energy performance contracts for Energy Auditors and Consultants;
- g) publishing the list of energy services providers on the AEE web page;
- h) disseminating the information on available financial mechanisms for energy services.

A pilot project on a basis of an energy performance contract, comprising the following actions:

- a) identifying pilot-projects, relying on the following sources: LEEPs, LEEAPs, sustainable development plans developed by the communities, which have adhered to the Covenant of Mayors, international projects, etc.;
- b) granting assistance for the development and compilation of the package of documents relating to the energy performance contract;
- c) granting assistance to prepare financing application/request if financing is covered from sources other than those belonging to energy services companies. Commercial banks and the existing funds (MoSEEF, MoREEF, EEF, etc.) may serve for financing of energy services.

Financing ESCO projects

The Moldavian Energy Efficiency Fund should be an instrument for financing of energy efficiency project implemented by ESCOs. The fund was established with an aim to finance through grants and loans projects for energy efficiency and renewable energy.

The international financial institutions as EBRD, World Bank etc. have developed financial facilities in Moldova for support investments in energy efficiency projects in Moldova. The Moldovan Sustainable Energy Financing facility (MoSEFF) was launched by the EBRD in order to support energy efficiency investments in Moldovan enterprises. Under MoSEFF the EBRD made a total of 42 million of EUR available for on-lending through local partner banks. The loans are in range from €10,000 up to €2 million (MoSEEF 2013).

The EBRD provided a loan worth 2 million EUR to Moldova as a part of the programme called the Moldovan Energy Efficiency Residential Financing Facility (MoREEF). It provides 35 million of EUR to finance energy efficiency projects in individual households or to housing associations as well as to energy savings and energy service companies (MoSEEF 2013).

Barriers

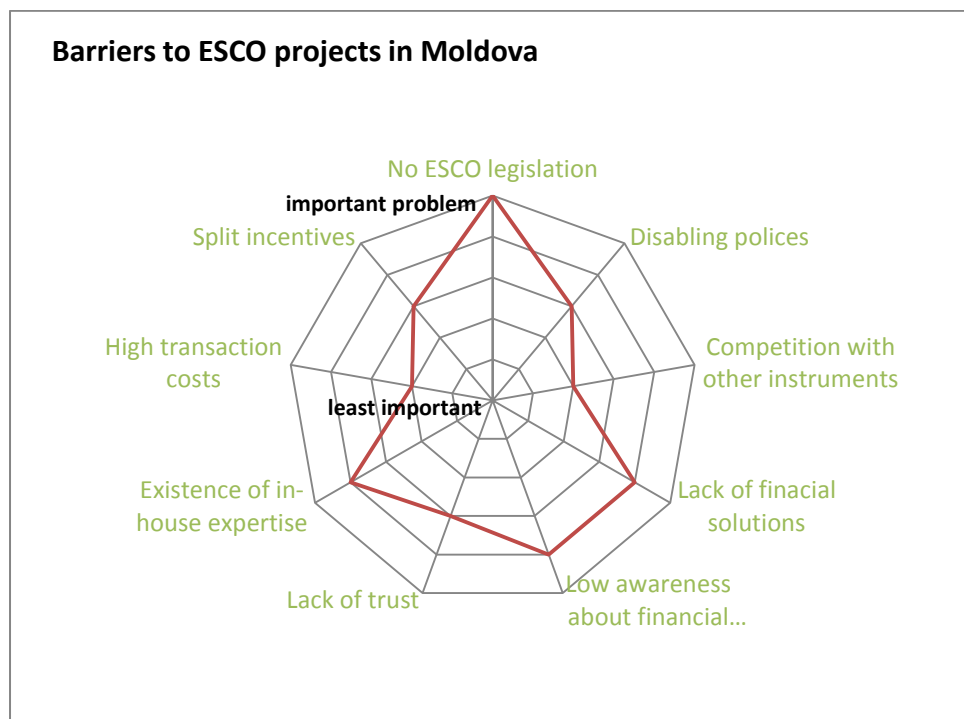
Lack of secondary legislation is one of the main barriers for development of ESCO model in Moldova. Full transposition of Energy Service Directive (now Energy Efficiency directive) should be priority in governmental policy. The Public Procurement Law shall be amended in order to enable public tendering of ESCO services. Therefore necessary is also amendment of Public Budget Law and adoption of new budget codes which will give precondition for ESCO investments in public buildings on national and municipality level (Government of Moldova 2013).

There is a risk of non-implementation of energy services during the first years, particularly, by the public sector, due to the reduction of budget allocations proportionally to the savings of means resulting from the project implementation. These provisions would deprive the Local Public Authorities from the financial savings, which could have served as coverage resources for the energy performance contract. In this context, the corresponding financial legislation might need amendments (Government of Moldova 2013).

The secondary legislation will enforce introduction for system for performance of energy audits and certification of buildings which are important for definition of base line consumption, calculation of savings and definitions of measures. The lack of energy data is also a barrier for ESCO model implementation.

Lack of expertise and a lack of in-house know how is one of the bigger barriers also for implementation of ESCO in Moldova. The public sector is not aware about energy efficiency and ESCO model.

In summary, the following graph illustrates the relative importance of barriers in Moldova:



Conclusions and future expectations

The growth of Moldovan ESCO market can be expected in next period if the government undergone realization of the strategies and programmes for energy efficiency which were adopted last few years. Implementation of the first NEEAP should have significant impact on development of ESCO market, since it set of activities related to energy services and ESCOs. It is conected also with preparation and implementation of secondary legislation which should include Energy Service Directive. Pursuant to the NEEAP, the Moldovan Energy Efficiency Agency should play very important role in promotion of Energy Services and ESCOs.

Possible break-through points

- Implementation of the First NEEAP;
- Transposition of the Energy Service Directive in secondary legislation;
- Implementation of pilot projects in Public sector on ESCO concept;
- Increased awareness raising activity.

Moldova in a snap-shot:

Number of ESCOs	none
ESCO market size and potential	no information
ESCO market trend	On the ground
ESCO association	none
Typical ESCO projects	No ESCO projects
Main type of contract	n/a

Russian ESCO market 2013

The ESCO market in Russia is still in its early stage of development. The new energy efficiency legislation that has been implemented since 2009, has enabled rapid growth of ESCO market.

Current ESCO market

The total number of ESCO companies that operating in Russia, is around 100 companies. They are distributed on the whole Russian territory. However, the most of them (around 50) are operating in Central Federal District (including Moscow). Most of them (50-75%) are small private companies with up to 50 employees, but there are also few public companies (Nadezhdin 2012).

ESCOs operating in Russia can be divided in the following types of companies (EC JRC 2012):

1. Small companies which originally were involved in energy auditing or turn-key engineering services and are now exploring the ESCO business.
2. Producers of metering equipment and automatic control systems and IT integrators who are starting to work on projects based on the EnPC principle.

3. ESCO-subsidiaries of utility companies which implement energy efficiency projects within their mother companies and have started implementing small pilot EnPC projects in the regions.

The “Federal Energy Service Company” – FESCO was established in July 2011 under supervision of the Ministry of Energy of Russian Federation (in accordance with Decree No.274). The main objectives of this public owned company are: creating condition for dynamic development of energy service market in Russia in accordance with best international practices, ensuring implementation of energy service contracts in public sector (on federal level) and defence industry and supporting the development of energy savings in Russian Federation through promoting of energy savings products. FESCO should provide technical expertise and monitoring of energy efficiency project implementation and unification and type design of engineering solutions (Garbuzova and Madlener 2012).

Although the FESCO was established in 2011 (by renaming the existing organization “Energocomplekt”) it has not implemented any project. It is still required to solve a number of organizational and financial issues for its effective functioning.

Prospective sources for financing of FESCO shall be: federal budget, private investors and others. In addition FESCO shall participate with at least 25% of share in Regional Service Companies (RESCO) that have been established as joint venture companies in Russian Federation with an aim to provide energy services on regional and municipalities level. FESKO can be one of the organizations who will be responsible for organization of finance for RESCO through interaction with commercial banks, private investors and other financial sources (Tulikov 2013).

At the present moment, at least 270 energy service contracts are signed (we consider the contracts with investment volume of more than 100 thousand rubles) totalling 3.9 billion rubles (86 million euros). In the budget sphere is made not less than 185 energy service contracts with investment volume of more than 100 thousand rubles total amount of 1.1 billion rubles (25 million euros), while in the private sector is made not less than 85 energy service contracts for the total amount not less than 2.8 billion rubles (62 million euros).

Russian public building sector, responsible for 9% of the total final energy consumption, has significant potential to save energy. Potential market for ESCO projects in public buildings and street lighting can be estimated in range from 140 - 590 million of EUR per year for the period 2012-2020 with required investment of 0,8-3,1 billion of EUR in 2020.

Types of ESCO projects

The public sector has huge market potential in Russia since it is in very bad condition in terms of energy efficiency. Main characteristic of this sector are (Nadezhdin 2012):

- The energy consumption is constant and measurable.
- Standard technological solutions can be applied.
- Contracts can be signed on basis of public contract rules.

A large part of the energy service companies have experience of realization of energy service projects in the public sector. The share of projects in the public sector in relation to the total volume of the market from 2009 to 2013 amounted to almost 70 percent, while the share of attracted funds for these projects is only 28 percent. It is obvious that this area is perceived by investors as a pilot site, where it is used for small investment volume for the first few projects for the elaboration of relevant skills. Exceptions are

projects in the field of street lighting, which provided a sufficiently competitive market, remain the most attractive for investors, regardless of the scope of implementation (public or private).

Not less than 406,7 million rubles (9 million euros) is currently the volume of the market in the public buildings: institutions of culture, health care, educational institutions, sports etc. (individual heating unit, heat controlling). The remaining projects are implemented in the public housing stock, street lighting, in the area of modernization of systems of the pumping equipment, variable frequency drives and the introduction of other technologies that have a high potential for energy saving and improving energy. At least 347.5 million rubles (7 million euros) is the volume of the projects for street lighting.

In the private sector customers in energy service contracts are industrial enterprises, power engineering, communal services, the organizations engaged in the management of apartment houses (on behalf of owners of apartment houses). Despite the lack of requirements to the energy service contracts in the private sector (such as those set for the public sector), a large potential for saving energy (industry - 64 million tons of equivalent fuel, energy - 127 million tons of coal equivalent), the interest of the owners of industrial enterprises in reducing costs - the development of energy services in these areas is not so strong. At present it is known about the energy projects in industry and energy, in various stages of study, with an investment volume of more than 100 million euros. One of the reasons is that the time for preparation of projects in industry and energy, the degree of their development, investment and expertise of specialists in the proof of the effect require significantly more than in the budget sphere. Projects of such level are able to realize a greater extent only large specialized organization.

ESCOs have also potential in the residential sector in Russia. The main clients for ESCO companies should be homeowners associations and local authorities for the building owned by them. In private buildings the problem is the development of EPC with homeowners associations and complexity of payment schemes. The implemented projects in residential buildings are connected with heating system modernization and temperature control (Nadezhdin 2012).

The term EPC is used for different types of contracts. Some of these contracts cannot be considered 'real' EPCs. For example, some contracts are simply subcontracting contract under which the company implementing the contract does not take on a performance obligation, nor provides the project financing.

Regulatory factors

The Russian President as a part of the governmental initiatives adopted in June 2008 the Decree No. 889 "Concerning some measures for improving the energy and ecological efficiency of the Russian economy" in which set a target to reduce the energy intensity of the Russian economy by 40% by the year 2020 compared to 2007. Therefore the issue of energy efficiency has gained significant importance. The "Energy strategy of Russian Federation up to year 2030" approved and adopted on 13 November 2009, defines the energy efficiency as one of the top priority of the Russian energy policy (Garbuzova and Madlener 2012).

The basis for introducing of ESCO model in Russian Federation is the Federal Law No. 261-FZ "On Energy Savings and Energy Efficiency and on amendments to certain acts of the Russian Federation" adopted on 23 November 2009 (Tulikov 2013).

Pursuant to this law, all state and local authorities, organization with state or municipalities interest, organization with regulation functions, public utilities companies for water, energy and fuel, industrial

enterprises with annual energy costs exceed 10 million RUB (around 250.000 EUR) as well as organizations that implement energy savings and energy efficiency projects are obliged to undergo energy audits at least ones in five years period of time, starting from 2012. The other organization can carry out energy audits on voluntary basis. The energy audits have to be provided by Energy Audit Company (EAC).

The amendments in the Federal Law are related to the Budget code of Russian Federation in order to allow public agencies to pay for long term EPCs from savings on their utilities bills (Evans et al. 2012).

The Federal Law of July 2005 No.94-FZ "About placing of orders for delivery of goods, performance of works, rendering services and municipalities needs" was also amended. This Law will be replaced on with the new Law "On the contract system in the sphere of procurement of goods, works, services and state and municipalities needs" adopted in April 2013 and enter into force from 1 January 2014 (Tulikov 2013).

Other regulations related to ESCOs are (Tulikov 2013):

- The Regulation of the Government of Russia Federation of August 2010 No.636 "On Requirements to the terms of the energy service contracts and peculiarities of determining the initial (maximum) contract price (tender price) on energy services" and
- Order of the Ministry of Regional Development of June 2012 No.252 "On approval of model terms of service agreement, directed on the preservation and (or) increase of efficiency of utility services with the use of the common property in an apartment house".

The Public procurement Law makes EPCs legal within the public procurement system and sets out the basics rules for such procurement. These include the fact that ESCOs must finance the EPCs and that the EPC tenders will take place in only one stage process (Evans et al. 2012).

Currently the Ministry of economic development of Russia jointly with the stakeholders and authorities develop a plan of measures on improvement of state regulation in the field of provision of energy services. It is expected that the plan will be approved in the end of spring 2014.

Market factors

The ESCO market shall growth in the next five-six years rapidly since the Russian Government set it as one of the priority in his program for reducing the intensity of Russian economy by 40% until 2020. Creation of a super ESCO – FESCO and regional ESCOs – RESCOs as well as creation of a specific financial institution for financing of the ESCOs should create conditions for faster development of ESCO services. The government is aware of the barriers that exist and tries to overcome them through improvement of the legislation (e.g. Introducing of tax exemption, transfer of property, guarantee of return of investments in residential sector) and through establishment of financial institutions, which should develop financial products even with an interest rate compensate from the federal budget.

Information, awareness and demonstration

In order to promote the ESCO model in all region of the Russian Federation the Russian Energy Agency decided to implement the projects "Energy service in the budget sphere in the region of the Russian Federation". The project will be implemented in several steps starting with selection of pilot regions of Russian Federation (municipal entities) and identification of key bodies (on local level) responsible for project implementation. In the next phase, after preparation of feasibility studies, preliminary design, organizational schemes and pre-investment documents for energy service projects should be developed.

The next steps shall be: planning of the budget for energy service contracts and definition of main terms of energy service contracts, development of tender documentation, placing of order for energy services, implementation of energy measures and monitoring and verification of energy savings (Tulikov 2013).

In 2012, the Russian Energy Agency officially translated the International Performance Measurement and Verification Protocol (IPMVP), which is currently available on the website of the developer - EVO. In 2014 it is planned to develop national standards for measurement and verification in Russia.

Financing ESCO projects

Pursuant to the Russian Public Procurement Law, ESCOs must include financing of projects as a part of the services under EPC. It means that ESCOs must take the financial risk for the project and carry out the financing. In the case of smaller ESCOs it has an impact on the working capital (Evans et al. 2012).

It was planned to create a special financial institution - the Energy Financial Agency (EFA). For these purposes were allocated 400 million rubles by the Russian Federal Energy Agency. The other partner was the Vnesheconombank.

The following model of the functioning of the EFA was expected: EFA should take a risk, and ESCOs should pay for the notes in instalments. ESCOs will sale the promissory note at a discount rate to commercial banks and they will receive the funds from bank necessary for purchasing of equipment and materials as well as for implementation of energy efficiency projects. The EFA will repay the promissory note to commercial bank (Tulikov 2013).

However, in 2013, the Russian Government had refused creation of this institution. It is currently assumed that instead of the EFA, should be established several regional financial institutions.

Financing remains a key problem for ESCOs in Russia. Russian banks are unfamiliar with the ESCO concept and thus reluctant to provide project finance to ESCOs while ESCOs have balance-sheet constraints to take on asset-backed loans. This acts as a barrier to further market growth.

Some state-owned banks have become active in the ESCO market by establishing ESCO subsidiaries. Gazprombank has set up its own captive ESCO called Gazprombank EnergoEffect. Gazprombank EnergoEffect currently has a small portfolio of projects in industry, street lighting and the utility sector. Sberbank has set up a subsidiary called Sberenergo Development which is looking into become active on the ESCO market.

Finally, the European Bank for Reconstruction and Development provided a seven-year EUR 20 million loan to Fenice RUS LLC in 2013.¹³⁸ The proceeds of the loan will be used by Fenice RUS to fund the investments it will have to make under EnPCs with Russian industrial clients.

Barriers

Although some of the legal barriers for ESCO development have been overcome through the new adopted legislation, there still legal barriers that constrain the rapid growth of the Russian ESCO market, which has a significant potential. Further development of ESCOs legislation will be crucial for development of the ESCO market in Russian Federation.

¹³⁸ <http://www.ebrd.com/pages/news/press/2013/130130c.shtml>

Some of the existing barriers are (EC JRC 2012):

- Lack of trust. Financial institution and public sector are not confidential in ESCO concept and in private ESCOs. Industrial client prefer to undertake the projects themselves instead of outsourcing these to ESCOs;
- High project development costs for especially for those projects that are tendered under public procurement law;
- Lack of technical expertise and lack of experience for implementation and preparation of projects based on ESCO concept and tender documentation for EPC;
- Rather long period of project implementation;
- High risk of EPC implementation in public sector;
- Lack of methodology for selection and evaluation of energy projects as well as for implementation of system for monitoring, evaluation and verification of energy savings;
- Access to finance: ESCOs are struggling to get access to finance for implementing their projects. Russian commercial and state banks are reluctant to provide project finance to ESCOs while the appetite for asset-backed loans is very low among ESCOs. The potential for expansion of ESCO services is severely constrained in the absence of project finance opportunities.

The necessary energy data for determination of basic consumption and energy savings will be provided after conduction of energy audits, which are now mandatory for public sector buildings and for public enterprises and installation of energy consumption meters. The regions and sub-regional entities have to prepare list of inventory for their facilities and energy certificates for their buildings (Evans et al. 2012).

In summary, the following graph illustrates the relative importance of barriers in Russia:



Conclusions and future expectations

Implementation of the new Energy Efficiency Law and legislation related to Energy Services and Energy Contracts should have positive influence on development of the ESCO market in Russia. In the same time achievement of the indicative targets for reducing of energy intensity of Russian economy and

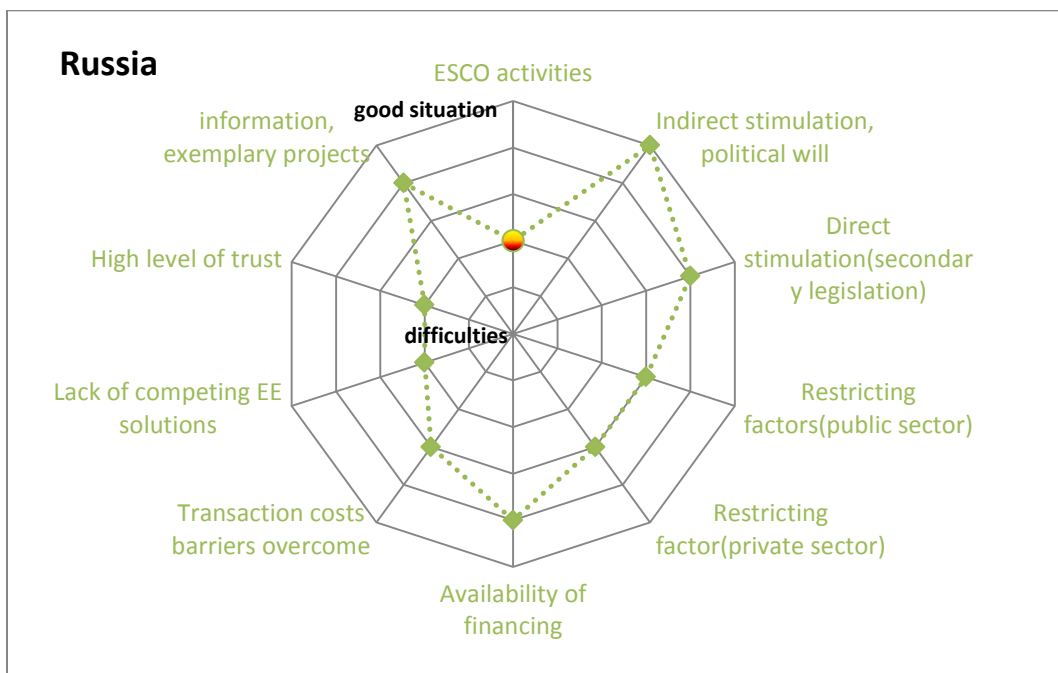
reducing the energy consumption in public buildings set in Energy strategies of the Russian Federation will put pressure on Russian public sector and industry to increase implementation of energy efficiency and energy saving projects.

Possible break-through points

- Implementation of the Energy Efficiency legislation for ESCOs;
- Improvement of Public procurement procedures;
- Creation of federal or regional EE funds;
- Increased awareness raising activity and realization of pilot projects;

The financing of ESCO projects (at least in public sector) will be ensured if the EFA will be developed as full operational Fund which is able to attract International Financing and Private investments for energy projects. In the same time the Ministry of Energy and Russian Energy Agency together with other federal bodies will work on promotion of ESCO as a model through implementation of pilot projects in all regions in Russia.

The following graph shows the key features of the Russian market:



Russia in a snap-shot:

Number of ESCOs	Up to 100
ESCO market size and potential	market size € 100 million/ year Market potential: € 2,8-7 billion
ESCO market trend	Growth since 2009
ESCO association	None
Typical ESCO projects	Refurbishment of building envelope. External lighting and street lighting Rehabilitation of district heating systems Replacement of pumps and installation od CHP
Main type of contract	Shared savings contracts

Ukraine ESCO market 2013

The ESCO market in Ukraine is still not developed although the first 10 ESCO companies were established in Ukraine in period 1997-1998. The economic growth from 2011 resulted with larger demand for energy services in industry and energy sector in Ukraine.

Current ESCO market

The number of ESCO companies increased and in 2012 in Ukraine were active around 30 ESCO companies. The most of the ESCO companies in Ukraine are small sized private owned companies. On the market are also operating several public ESCO companies, which are owned by local authorities or by public enterprises (EC JRC 2012).

The first public ESCO company, the “Ukraine Energy Service Company” (UkrESCO) was established as a Joint Stock Company in 1998 pursuant to the dedicated Loan Agreement between Ukraine and EBRD (Novoseltsev, Kovalko, and Evtukhova 2013).

As of 2012 the potential size of the ESCO market was estimated around €100 million in the building and in industry sector.

In 1999, five ESCO companies established the Association of Energy Service Companies of Ukraine. The main objective of this association was to encourage better cooperation among private ESCOs, public sector, financial institution and the business sector. After a successful start and few realized projects, the number of members increased to 37 companies. However after 5 years the Association ceased to exist (Stepanenko n.d.).

In 2013, the new Ukrainian ESCO association was established by 6 ESCO companies. The main objective of the association is to initiate municipal and regional projects based on ESCO model.

Types of ESCO projects

The most frequently energy efficiency projects implemented by ESCO companies in industry are projects related to improvement and reconstruction of heat supply systems, reconstruction and modernization of compressed air production systems, modernization of pump stations, industrial process optimization and construction of cogeneration plants. Rarely covered are projects regarding improvement of installation for industrial cooling and waste heat recovery (Stepanenko n.d.).

Energy audits constitute the basic services provided by ESCO companies in Ukraine. There is large demand on audits in industry as well as in the building sector. The costs for this kind of services are low but they are very important for development an ESCO market. There about 30 companies able to carry out energy audits professionally (Stepanenko n.d.).

The history of ESCOs in buildings started in 2001. Since 2001 around 100 energy efficiency projects have been realized in residential and public buildings. The projects were implemented mainly with the help of grants provided by international financial institutions and with the technical assistance of donor organizations (such as UNDP, USAID, and the EU). The realized projects were successful (achieved up to 40% heat energy savings) and demonstrated the ESCO concept. The main problem for implementation of EE in multi apartment buildings is not established co-owners associations or condominiums. The ESCO companies do not like to conclude contracts for EE projects with large number of owners/clients (Novoseltsev, Kovalko, and Evtukhova 2013).

Majority of the EE projects have been related to improvement of heat supply systems for public and residential buildings, since the large number of the buildings in Ukraine are connected to the district heating systems, which are in very bad condition and need large reconstruction and modernizations. The heat supply sector is stuck in a cycle of financial and physical decay with acute and chronic consequences for service quality and reliability (Stepanenko n.d.).

Some of the public ESCOs were established in order to provide energy services for several municipalities and to serve as pilot regions for demonstration of ESCO projects in Ukraine.

The “ESCO Rivne” was established as a closed joint stock company in November 2003. The financing of the projects was ensured through the grant received from GEF in the amount of \$5.3 million. The pilot projects were implemented with a technical assistance of UNDP in the period 2003 - 2011. The role of ESCO Rivne in this period was to design, realise and finance all necessary and cost effective investments in the municipality's buildings and in the district heating facilities and network of Municipality of Rivne through energy performance contracting (EPC) or other applicable contracts. In addition in this period it was developed a template for an EPC. The ESCO Ravne should also have disseminated the achieved results to other municipalities in Ukraine through workshops and seminars. The programme has had large impact (environmental, social, technical and financial) to final beneficiaries. The new district heating system increased the living condition for around 300.000 inhabitants in Rivne as well as for around 1000 beds in two Municipality hospitals (O’Brian 2012).

Regulatory factors

Ukraine – as a member of the ECT – is obliged to transpose and to adopt EU legislation in the field of energy savings, energy services and energy efficiency. Ukraine started this process several years ago, but it is still not completed.

The State Agency for Energy Efficiency and Energy Saving (with the support of World Bank at initial stage) developed a draft National Energy Efficiency Action Plan (NEEAP). The indicative target of this action plan is to ensure energy saving of 9% of the average final energy consumption until 2020. The first NEEAP for Ukraine is still not adopted.

The State Target Economic Program on Energy Efficiency 2010-2015 was adopted in March 2010 to implement the goals of the Energy Strategy, and supersedes the State Complex Program of Energy Saving, which come to an end in 2010. It has as a goal reducing the energy intensity of GDP by 20% compare to 2008, reducing dependence on imported energy sources (particularly natural gas, where substitution to the tune of 15 billion m³ is the expectation) and increasing the use of renewable resources by a factor of five. Other expected outcomes from the programme are: reduction of 15%-20% of the level of greenhouse gas emissions and reduction of 50% of the heat losses from residential and public buildings.¹³⁹

On 12 January 2012, the Draft of the Law “On energy efficiency in residential and public buildings” was passed to the Parliament Committee on Construction, Urban Development and Regional Policy by the Cabinet of Ministers of Ukraine. The draft Law was adopted by the Verkhovana Rada in May 2012, but its consideration has been postponed. This Law will provide minimal requirements and standards for EE

¹³⁹ Source: http://www.energyagency.at/fileadmin/dam/pdf/veranstaltungen/Vortrag_Kisimes-Ukraine.pdf

in buildings and will envisage energy certification and energy auditing of buildings. Most of the requirements from EU EPBD directive should be transposed through this Law.

In 2013, Ukrainian parliament received two versions of the law on ESCOs. This law shall regulate ESCO activities in public and municipal sectors, particularly is related to renovation of public buildings (schools, hospitals, kindergartens etc.). This law should create a new market for energy services and ESCOs and will cover 38.000 public buildings in 26 regions of Ukraine (EC JRC 2012).

Market factors

The energy dependence of Ukraine is very high since 70% of the consumed natural gas and almost a half of oil are imported from Russian Federation. It pose a considerable risk for energy security of the country (as was proven during the winters 2006-2007 and 2008-2009 when the interruption of Russian natural gas took place after disputes over the gas price) (Maissner, Naumenko, and Radeke 2012).

Industry, residential property, utilities and the power sector have the lowest energy ratings and therefore will have the largest potential for increased energy efficiency. These sectors possess outdated technologies along entire value chain. The energy intensity of Ukrainian economy is as much as four times higher than in EU 28 and is also much higher compare to other developed regions in Asia and CIS countries. This partly reflects interference in ownership and pricing in these industries which in turn reduce competitiveness. (Maissner, Naumenko, and Radeke 2012)

Therefore the demand for EE projects is much higher in industry and will remain as a major source for ESCO projects in Ukraine in next years.

The building sector in Ukraine holds also significant potential for improved energy efficiency and represents around 40% of the total final energy consumption. A significant part of residential and public buildings was built during the period of mass construction period 1960 – 1991 and only 7,4% of the building stock was constructed after 1991. Therefore most of the buildings need urgent renovation in terms of energy efficiency improvement (Stepanenko n.d.).

Awareness and trust

Information campaigns for public awareness rising for Energy Efficiency have been realized in the framework of almost all projects implemented by IFIs (EBRD, WB ect.) or by other donor organization as: GIZ, USIAD, UNDP. e.g. the UNDP Rivne ESCO project had as a project component the organization of workshop and training events on ESCO and dissemination of results from implemented ESCO project to raise awareness among local authorities, public enterprises and households for ESCO.

In the framework of the USAID project "Municipal Heating Reform Project in Ukraine" implemented from 2009 to 2011 35 demonstration projects have been implemented in 11 cities of Ukraine. The findings of the demonstration projects are relevant also for the ESCO business since they were implemented in variety of types of buildings and in buildings with different ownership structure: public and private. In implementation of the projects were included also local ESCO companies, which provided energy audits or participate in preparation of Municipal energy plans (Hankinson et al. 2012).

In 2012 EBRD started the pilot project for development of an Energy Performance Contracting pilot project in public buildings (schools and kindergartens) in City of Dnepropetrovsk. The project will be implemented with the Municipal Energy Managing Enterprise. The Project will support the creation of public sector demand for ESCO energy efficiency projects (in particular EnPC), while supporting private

sector ESCOs with finance to supply this demand. The Company will competitively tender on behalf of the municipality the demand-side ESCO energy efficiency projects on the basis of EnPC. The Project will be a first step to demonstrate benefits of private ESCO services to the public sector with a view of a later national roll-out of EPC projects. Two tenders with an investment amount of roughly EUR 10 million in total are prepared and are supported with an EBRD loan and tendering is anticipated in early 2014. Further tenders are being prepared (EBRD 2013).

Financing ESCO projects

Third part financing is still a new type of service in Ukraine, which is yet to be mastered by ESCO companies and financial institution. EPC is still not in place and most of the companies do not use such type of contracting.

The financing of EE projects in Ukraine mainly has been provided by loans received by IFIs such as EBRD, IFC, GEF, WB and distributed through commercial banks. No public energy efficiency revolving fund exists.

The Ukraine Energy Efficiency Programme (UKEEP) is a credit facility developed by EBRD realized through the Ukrainian Participating Banks (Ukreximbank and Megabank), which provide debt financing to private small and medium sized enterprises for industrial energy efficiency and renewable energy projects. Only private owned companies are eligible for UKEEP financing. UKEEP could provide up to 2,5-3 million USD in loan financing. The loans have competitive terms and conditions, but the precise levels depend on the borrower and the negotiations with Partner Bank. In the period 2007 – January 2013 75 projects were approved with a total amount of 112 million USD. Typical projects are: rehabilitation of boilers, replacement of old gas boilers with condensing boilers, switch from electrical heating to fuel based district heating, energy management system or building management systems, etc. (UKEEP 2013).

Lending for residential sector is also very limited in Ukraine, because of several barriers which limited the market for financing of EE measures in residential building sector such as: high interest rate and local reserve requirements from local banks for lending to home owner associations, limited number of local financial institutions, lower energy tariffs for residential sector and perceived lack of business potential in the residential sector in Ukraine as well as the local currency lending constrains for IFIs, limiting ability to lend in UAH.

The most of state or municipal owned enterprises as district heating systems operators are facing with insolvency and cannot conclude ESCO contracts.

Barriers

The development and implementation of legislation is necessary to create economically sound conditions for attracting domestic and foreign investments in EE projects. Although the new Law on procurement is adopted in 2010, the public procurement rules and procedures are inflexible and complex and have to be improved. The ESCO model is not recognized by authorities as an individual business model providing Energy Efficiency services, but as a contract for delivery of goods or consulting services. (EC JRC 2012)

Contractual arrangement specific to ESCO project are not in line with national regulations. The standard EPC contract template shall be developed as well as public tendering procedures based on EPC shall be prepared (EC JRC 2012).

Municipal budgeting rules make difficult for municipalities to borrow funds for EE projects, because the governmental rules preclude the multi years budgeting for municipalities. The multiyear budgeting is required for municipalities to enter into long terms contracts with ESCOs.

Lack of financial products and lack of professional experience by commercial banks for financing of EE projects is also indicated as an important barrier. They perceive lack of business potential especially in residential sector. The Commercial banks offer the credits with high interest rates and high collaterals and therefore the potential clients from industry or residential sector are not interested in borrowing. The payback period is very high due to low energy tariffs for households.

There is lack of information and/or skills in industry sector to enact technical options to achieved energy efficiency. The negative externalities of global and local pollution are not reflecting in the costs of energy use. Lack of predictable and transparent energy polices, uncertainty about future development of prices for natural gas and electricity are barriers for industrial enterprises to enter into long term contracts with higher investments.

Lack of reliable energy consumption data in industry or in residential sector makes it difficult to establish baseline consumption as well as provide data on energy savings.

In summary, the following graph illustrates the relative importance of barriers in Ukraine:



Conclusions and future expectations

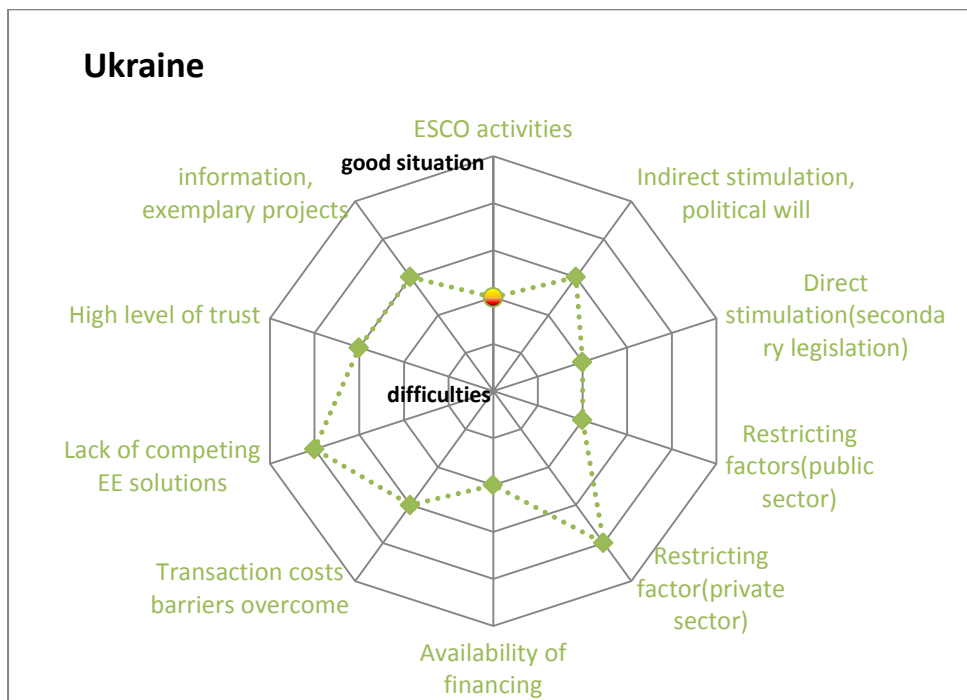
The crucial factor for much faster development of the Ukrainian ESCO market will be new legislation for EE and ESCOs, which will create the legal basis for implementation of EE projects on ESCO model. It is expected that the laws will be adopted by Ukrainian Parliament in 2014. Also implementation of EE polices shall lead to increase investments in energy efficiency projects.

Possible break-through points:

- New legislation for EE and ESCO;
- Improvement of public procurement rules;
- Establishing of public funds for Energy Efficiency;
- Increased awareness raising activity;
- implementation of local (SEAPs) and national EE plans (NEEAP);

Implementation of national and level EE plans and programmes (as NEEAP and SEAPs) should be contributed to faster development of the ESCO market in Ukraine. Currently 49 municipalities (including Kyiv and Lvov) signed the Covenant of Mayors initiative, and 16 of them already prepared and submitted the SEAPs. The ESCO model can be used for financing and implementing of energy efficiency projects, especially for renovation of heating supply systems and public buildings.

The following graph shows the key features of the Ukrainian market:



Ukraine in a snap-shot:

Number of ESCOs	Around 30
ESCO market size and potential	€ 100 million / year
ESCO market trend	Increased since 2011
ESCO association	several
Typical ESCO projects	Rehabilitation of energy supply system in industry, installation of on-site power generation (co-generation, micro cogeneration); reconstruction of district heating systems and street lighting in cities. Space heating, air conditioning, control and automation, in door lighting in residential buildings. Refurbishment of building envelope.
Main type of contract	BOOT, very few EPC contracts

Conclusions

During the past ca. 3 years most of the European ESCO markets have grown and developed their complexity including a higher institutionalization. Thus the average European ESCO market has improved. Development is also observed in case of the non-EU countries covered in the report.

There are more ESCOs with more projects in 2013 than there were in 2010, and ESCOs have foraged in areas where they were rare before. Nevertheless, the markets are far from reaching their potential. There are only few mature markets, such as Germany, the Czech Republic, France, and Austria. Even these can expect to go through significant growth in the future. The ESCO survey carried out during 2012-2013 revealed that in spite of the financial crisis, the ESCO sector could kick-off in several typical non-ESCO countries, such as Denmark and Spain. Decrease or deterioration of the ESCO sector was rare during the observed period (only Hungary experienced a clear decline, while the change in Austria and Sweden are debated).

EPC and other alternative and locally tailored contracts have increased their popularity. The markets are driven as much by market forces (increasing energy prices, growing interest from potential clients, development of partnership between players on the demand and supply side, as well as between ESCOs and subcontractors), as by dedicated policy measures, regulations and financial solutions. Interestingly the list of drivers is similar in many countries, but the leveraging success factor (and leading barrier) is diverse.

Both the general energy efficiency market and the ESCO markets are expected to grow further in the future. There are several countries where experts foresee a near-future ESCO boom.

Overall development of the ESCO markets during 2010-2013

The key conclusions of the previous ESCO status reports were that the ESCO markets of the European countries vary widely in terms of development and size, as well as in features and frameworks. While this statement is still accurate on the whole in 2013, the markets have more in common than before.

First of all, **almost all of the European markets have grown since 2010, and only few of them remained stable or declined**. The growth has unfolded in size, referring to a larger number of companies/projects, as well as in strength reflected in market volume, more developed market structure, availability of institutions, or wider market coverage. The growth has been largely fuelled by the growth of demand, i.e. an expansion of interest from the side of potential clients (e.g. the public sectors in the Czech Republic, Denmark, the UK), who look forward to alternative financial and managerial solutions of energy renovations. Nevertheless, there are countries where crucial regulatory drivers, information dissemination and financial solutions were introduced during the observed period (see section on drivers below). Interestingly, growth could be realised even in countries where the regulatory framework poses a problem for ESCOs (e.g. in Italy, Greece, the industrial sector of Slovakia, etc.).

Table 4, Table 5, and Table 6 show the sizes and relevant changes of every ESCO market in our study.

Table 4. The development status of the ESCO markets in 2013, and the change between 2010 and 2013.

	development status*	change since 2010**
EU		
Austria	good	stable (or slowly decreasing)
Belgium	moderate	slow growth
Bulgaria	preliminary	unchanged
Croatia	preliminary	slow growth
Cyprus	not existent	unchanged
Czech Republic	good	slow growth
Denmark	moderate	strong growth
Estonia	not existent	unchanged
Finland	moderate	unchanged
France	good	strong growth
Germany	good	slow growth
Greece	preliminary	slow growth
Hungary	preliminary	strong decrease
Ireland	preliminary	strong growth
Italy	moderate	slow growth
Latvia	preliminary	unchanged
Lithuania	preliminary	unchanged
Luxembourg	preliminary/not existent	unchanged
Malta	not existent	unchanged
The Netherlands	preliminary	slow growth (or slow decrease)
Poland	preliminary	slow growth
Portugal	preliminary	slow growth
Romania	preliminary	slow growth
Slovakia	preliminary	slow growth
Slovenia	preliminary	slow growth
Spain	preliminary	strong growth
Sweden	preliminary	slow growth (or slow decrease)
United Kingdom	good	balanced growth
Other European countries		
Norway	preliminary	slow growth (but volatile)
Switzerland	preliminary	slow growth
Southeastern Europe		
Albania	not existent	unchanged
BiH	preliminary	slow growth
FYR Macedonia	not existent	unchanged
Kosovo	not existent	unchanged
Montenegro	not existent	unchanged
Serbia	preliminary/not existent	stagnation (or slow growth)
Turkey	preliminary	slow growth
Eastern Europe and Transcaucasia		
Armenia	preliminary	slow growth
Belorussia	preliminary/moderate	n/a
Georgia	not existent	unchanged
Moldova	not existent	unchanged
Russia	preliminary/moderate	slow growth (or slow decrease)
Ukraine	preliminary/moderate	slow growth

* The development status reported in this table represents a qualitative evaluation performed by national experts based on the number of active companies, the market volumes and potentials registered in the countries.

** Based on the JRC survey 2012-2013. If answers from respondents varied largely, the alternative views are shown in brackets.

Table 5. Number of companies and market volumes in the EU countries, Norway and Switzerland.*

	number of ESCOs		market size		market potential
	in 2010	in 2013	in 2010	in 2013	estimated in 2012
EU					
Austria	over 50	over 50	n/a	€15-20 m	n/a
Belgium	10-15	10-15	n/a	€5 m	€500 million-several billion
Bulgaria	few	7-12	€6 million	€33 million (?)	€500-900 million
Croatia	2	10	€10 million	€100 million	n/a
Cyprus	0	0	n/a	0	n/a
Czech Republic	8-10	20	€2-4 million	€10-20 million	€100-500 million
Denmark	10	15-20	€8-25 Million	€140-150 million	€1 billion
Estonia	2	2 (3?)	n/a	n/a	€100 million (renovation of buildings)
Finland	8	5-8	€4 million	€10 million	€200 million
France	100	350	€4-5 billion	€75-100 m for EPC, €3.2 b/year for all	€250-500 m for EPC and €5 billion for all ESCO projects
Germany	250-500	500-550	€1,7-2,4 b/a	€3-4 billion, of which €150 million is EPC	€20-30 billion
Greece	2	5	n/a	0	€5 million
Hungary	30	10	n/a	n/a	n/a
Ireland	15	ca. 30	n/a	n/a	n/a
Italy	100-150	50-100	€275 M in 2008; €387 M in 2009	€500 million	€1-10 billion
Latvia	5	8	€1-1.5 million	€2-3 million /year by one of the 7 ESCOs	€100 million-€10 billion
Lithuania	6	3-5	n/a	n/a	n/a
Luxembourg	3-4	3-6	0	0	€5.1-6-2 million
Malta	0	0	0	n/a	n/a
Netherlands	50	50	n/a	n/a	€30 million/year
Poland	3 to 10	30-50	€5 - €10 million/year (current value)	EUR 10-25million (2011) (annual turnover)	€25-75 million annually (economic potential)
Portugal	10 to 12	100	€10-30 million	n/a	€100-200 million
Romania	14	15-20	ca. €50 million	n/a	n/a
Slovakia	5	6-8		n/a	n/a
Slovenia	2-3	5-6	n/a	€3million	€15 million
Spain	15	20-60	€100	€300-400 m/yr	€1.5-2-6 b
Sweden	8		€60-80 million	€60-80 million	€300 million/yr
United Kingdom	20	30-50	€400 million	n/a	n/a
Other European countries					
Norway	5	10	€25 million	n/a	n/a
Switzerland	76 (7-10?)	6	€170-350 m/year (uncertain)	uncertain estimates	

* Note: please refer to the country texts for the content of these values. They are robust and rarely comparable because of the content – in case of the number of ESCOs differences are due to the definition of these companies in the given context, while in the case of the market sizes, sources include different parts of the value chain and/or calculate or estimate these in a variety of ways.

Table 6. Market sizes from the point of number of companies and market volumes in non-EU European countries.*

	number of ESCOs		market size		market potential
	in 2010	in 2013	in 2010	in 2013	estimated in 2012
Southeastern Europe					
Albania	0	0	n/a	n/a	n/a
BiH	n/a	5	n/a	n/a	n/a
FYR Macedonia	1	0	n/a	n/a	n/a
Kosovo	0	0	n/a	n/a	n/a
Montenegro	0	0	n/a	n/a	n/a
Serbia	10	3-5	n/a	n/a	n/a
Turkey		30**	n/a	n/a	n/a
Eastern Europe and Transcaucasia					
Armenia		11	n/a	n/a	n/a
Belorussia			n/a	n/a	n/a
Georgia	0	0	n/a	n/a	n/a
Moldova	0	0	n/a	n/a	n/a
Russia		up to 100	n/a	€ 100 million/ year	€ 2.8-7 billion
Ukraine		around 30	n/a	€ 100 million/ year	n/a

*Note: please refer to the country texts for the content of these values. They are robust and rarely comparable because of the content – in case of the number of ESCOs differences are due to the definition of these companies in the given context, while in the case of the market sizes, sources include different parts of the value chain and/or calculate or estimate these in a variety of ways.

** Indicates the number of EVD companies with state authorization (see country chapter on the definition of EVD).

The geographical distribution of ESCO companies and projects is uneven within countries. For example in Germany, the ESCO market is underdeveloped in the east, except for Berlin, while well-developed in the west. In Austria, a few regions and cities such as Styria, Salzburg, Tyrol and the city of Vienna, are leaders in using ESCO projects.

Many of the ESCO markets have not only grown in size, but have started to show a **structured**, more **mature** format. One or more of the following market qualities have been established during 2010-2013 in the process of maturation:

- the markets are becoming demand driven,
- policies acknowledge and support the ESCO solution,
- facilitators¹⁴⁰ exist and are effective;
- ESCO associations have been set up or are planned,
- model contracts, standards and/or intensive information dissemination are developed and carried out by third parties/market facilitators;
- participation of a wide array of companies, including consultants, small enterprises, large ESCOs, utilities, etc., indicating an open and competitive market.

The following table summarizes the existence of certain indicators of maturity, namely the market driver (demand, supply and/or facilitators), the existence of ESCO associations and the involvement of utilities and energy suppliers in the market (see Table 7).

¹⁴⁰ see more on facilitators under the relevant heading below

Table 7. Institutionalization of ESCO markets in the EU Member States, Norway and Switzerland.

	driver* (D-demand; S-supply; F-facilitators)	association (year of establishment if known)	engagement of utility (supply, distribution, etc.) companies
EU			
Austria	D	yes (2005)	yes, starting
Belgium	F (D)	yes, two	yes
Bulgaria	S	no	n/a
Croatia	S	no	n/a
Cyprus	F	no	no
Czech Republic	S & F	yes (2011)	yes, some
Denmark	D	no	yes
Estonia	none (S)	no	no
Finland	F (D)	no	no
France	F (D)	yes, several	yes
Germany	D & F	yes, several	yes and increasing
Greece	S	no	no
Hungary	S	no	yes
Ireland	F	no	yes
Italy	D	yes, several	yes
Latvia	S	no	starting now
Lithuania	S	no	no
Luxembourg	D	no	n/a
Malta	none	no	
Netherlands	S	yes	
Poland	S	no	yes
Portugal	D in industry, F in public	yes (2011)	starting now
Romania	F	yes (2013)	starting now
Slovakia	D	no (under discussion)	yes
Slovenia	S	no	starting now
Spain	S	yes, several	some
Sweden	D	yes (2006)	yes
United Kingdom	D	yes	yes
Other European countries			
Norway	S	no	n/a
Switzerland	S	yes	yes

* The market players (such as energy service supply or demand sides or independent facilitators) that act as the main actors or drivers of the ESCO market growth/transformation are indicated in this column. They are mostly found to successfully perform promotion, information dissemination or other activities with a positive effect on the market. In some countries there may be different driver types (indicated in brackets in case their role is less relevant compared to other types). The key players may differ depending on the geographical region or the demand sector. Furthermore, the situation in a country can change drastically within months or years. The information reported in the table refers to the market situation as of the end of 2013 and should be referenced with caution for the reasons just mentioned.

Types of ESCO firms

When markets have grown, the new entrants have been mainly either small engineering/construction firms (e.g. in France, Ireland, Slovenia, the UK) and/or utilities opening up their businesses towards energy services. These energy companies are rarely interested in earning an extra profit from their ESCO projects directly (although that can be the case), and they are either lead by regulations on energy

efficiency obligations¹⁴¹ or DSM programmes (e.g. Denmark, Latvia, Slovenia), and/or they offer energy services to attract new customers and increase loyalty of current ones (e.g. in Latvia, Austria, Denmark, Portugal). In Germany energy supply has been moving towards decentralised energy supply, and local and regional energy companies appeared on the energy services market in order to fulfil increasing interest from customers (MPW Institute LLC 2013).

In the EU neighbouring countries, small local engineering companies and construction firms are the most common ESCOs. Furthermore, the involvement of agencies and special vehicle (SPV) companies supported by international donors is typical. These latter ones provide general support for the market (financing, training, lobbying, etc.), while also implement (pilot) projects. They can be considered the equivalents of public ESCOs in European Member States. For example the Ukrainian and Moldovan markets were set up through these dedicated “ESCO agencies”.

The number of public ESCOs has also increased in Europe. Public ESCOs participate for example in the markets of Switzerland and Croatia. In Russia, FESCO was established in July 2011 under the supervision of the Ministry of Energy. There are several public ESCOs in Ukraine, the first one, UkrESCO, was established already in 1998. The public ESCO model used by Fedesco, Infrac and Eandis in Belgium has been referred to as an “integrating” organisation¹⁴². They contract public entities (clients) directly, and then subcontract the tasks to smaller, private suppliers on a competitive basis. Hungary and France are in the process of introducing a public ESCO at the moment.

It is interesting that Energy Performance Contracting is provided by different size of companies depending on the country. The few international big giants dominate the EPC market in Germany, Portugal, Belgium and mostly in Denmark and Sweden. However small companies can offer EPC in France, as opposed to the chauffage contracts generally carried out by large firms.

ESCO projects may even be carried out by a community of residents and the local businesses. The Meadows Ozone Energy Services Limited (MOZES) replaces the traditional energy suppliers in the region of Nottingham. The MOZES ESCO is responsible for financing, installing, operating and maintaining PV systems that supply the residents – who own the company – with renewable electricity via energy supply contracts (Hannon, Foxon, and Gale 2013). Similar idea has been advocated in Denmark by some municipalities (Jensen, Nielsen, and Hansen 2013), and the city of Győr in Hungary plans to transform their ESCO project (Raab-SOL) into a community lead district renovation, where the ESCO would be a facilitator rather than the implementer (Grosser Lagos 2013).

Facilitators and associations

The **role of facilitators has not been duly acknowledged** in the development of ESCO markets (Bleyl et al. 2013). In a well-developed ESCO market, the buyers look for solutions to implement energy saving measures and/or property renovations and improvements. In this process they should consider the ESCO contract as an alternative to for example own implementation, leasing, outsourcing, etc. However, ESCO solutions are complex and are difficult to evaluate and compare – especially with alternatives. In most countries potential clients are not even aware of the existence of ESCOs. Bleyl et al. (2013) collected a list of tasks that facilitators can and do perform. The list includes overall information, amplification of the use of the ESCO concept, helping interested customers of the public sector to

¹⁴¹ The role of EEOs in the launch of ESCO projects has been advocated by some, and negated by others. There is no straightforward link. See more under “Success factors” below.

¹⁴² Singh et al. (2010) have applied the term “super ESCO”.

prepare a tender or other announcement, selecting the winner, concluding a contract, monitoring and verifying savings, etc. From the clients perspective all of these and other steps in procuring or contracting an ESCO is – to say the least – challenging. These tasks require specialized knowledge in technology, financing, management, even communication, which a facilitator can offer.

There are a number of organisations that act as facilitators in Europe, for example **national (or local) energy (efficiency) agencies** (e.g. Motiva in Finland, SEAL in Ireland, the Graz Energy Agency in Austria, the Berlin Energy Agency in Germany, the Cyprus Energy Agency in Cyprus, etc.), **(private) energy audit companies, some legal advisors and private facilitators** (e.g. the Swiss market is expected to be launched with their help), or the **EPC procurement advisors** in the Czech Republic.

In a few countries the **government** can take up this task, for example the Ministry for Energy and Natural Resources in Turkey. In the non-EU/EEA countries, **IFIs** can typically act as facilitators, e.g. the World Bank/GEF in Armenia, EBRD in the West Balkans. IFIs are also present in some EU countries, e.g. EBRD in Romania and Bulgaria. In these countries, **agencies are set up by the government or external donors** to stimulate the energy services markets, e.g. the Energy Efficiency and Cleaner Production Center in Georgia or the Moldovan Energy Efficiency Agency.

There are 11 Member States, Switzerland and Ukraine that are aided by one or more associations, about one quarter of which were established since 2010. Furthermore, in Slovakia, Slovenia, Sweden, the Netherlands, and Switzerland the establishment of further associations is being discussed currently. Besides, EFIEES, the European Federation of Intelligent Energy Efficiency Services, represents private ESCO companies that are able to provide an overall energy management service to end-users. There are several non-official organizations with similar functions, such as the ESCO Club in Poland, the Bulgarian WEC Committee, the ESCO network in Denmark, DEEM group in Hungary, the National ESCO Action Group in Ireland. Of the non-EU/EEA countries, Armenia has an ESCO association since 2006, Ukraine established an association in 1999, which stopped working after 5 years and was recreated in 2013, and there are plans in Turkey to establish one.

Contract types

The most **commonly used contract type is still the chauffage contract**¹⁴³, i.e. heat supply contract. There are **only a few countries, where EPC dominates**, e.g. in Austria or the Czech Republic. Even in Germany, where EPC enjoys significant popularity as a result of the Berlin Energy Agency projects (Energy Saving Partnership model), only 8-10% of the market is covered by EPC.

During the 2010-2013 period two trends were seen in the countries with a relatively developed ESCO market. On the one hand, clarity has increased in regards the meaning and clarity of existing contracts, either because of the creation or the dissemination of standardized contract models or guides or because of the introduction of definitions/standards (e.g. standardized contracts in the RE:FIT programme in the UK, the EPC standard in Norway, certification and standards in Austria, etc.). In other countries, more flexibility was allowed in the contracts or the contracting process than before (e.g. Denmark, UK), and so called “negotiated procedure” is followed (Belgium).

In parallel to strengthening existing contract types and awareness about them, new contract types emerged during the period under observation:

¹⁴³ For definitions, please see the “Background” section.

- The traditional one-element contracts in France have been transforming to incorporate further elements, “small extras”, such as audits, financing, monitoring. As a result, contracts are better tailored for the needs of the client.
- **Integrated Energy Contracting (IEC)** is a newly applied model, whereby energy efficiency and energy supply measures are combined under an EPC project, with energy efficiency measures enjoying a priority. IEC contracts are simpler than normal EPC, and therefore less expensive. IEC has been developed for the German and Austrian markets, and is used in Greece and the Netherlands (Bleyl 2012; Wargert 2011; EC JRC 2012).
- **smartEPC** was developed in Belgium, to integrate energy, maintenance, comfort and building value performance contracting.
- **EPC+** is an ESCO contract model combined with state grants and forfeiting, in order to provide finance for large scale renovations of bloc-houses that are in particularly obsolete state (Government of Latvia 2011).
- “**Function agreements**” or “**comfort agreements**” are common in Sweden. These are “chauffage” contracts, based on the provision of an agreed level of comfort or function, and the payment for energy is substituted with the payment of the level of service.

Target sectors

ESCO projects are mostly implemented in the public sector (buildings and street lighting) and in industry. The preference depends on the national circumstances, on the openness and willingness of the public administration, on legal barriers in the public sector, and on factors such as size of the sector, size of the individual installations, financial capacities, long-term thinking in industry.

It could be noted during that sectors that were absolutely not attractive for ESCOs before, such as residential buildings and infrastructure (transport), were touched upon during the period 2010-2013. The problems related to these sectors include that they are decentralised and the projects would be very small while experiencing higher transaction (information and face-to-face interaction) costs. Moreover, the lack of trust from the potential clients is higher than in other sectors, potential clients have low liquidity and aversion to involve bank loans, and the split incentive problem is evident in most countries due to a high rate of renting, etc.

In spite of these traditional barriers, there are trials to engage these tricky areas. There was an ESCO in the Netherlands that had projects in the **transport** sector; however detailed information is not available about the project(s) and the results achieved. Jensen, Nielsen, and Hansen (2013) show that in the so called “strategic ESCO approach”, municipal ESCO projects have the potential to be disseminated into **infrastructure** improvement. Water supply renovations have been carried out by ESCOs in Spain.

The **residential** sector, public and private, has been given an increasing interest in the form of pilots (e.g. the FRESH project¹⁴⁴ in Italy, France and the UK, and the ESPARR project in Norway), but also in the form of ESCO-initiatives (e.g. in Denmark, Hungary, Estonia, France, Poland, Latvia, the Netherlands, Sweden, the UK, Germany and Switzerland). The Bulgarian government also expects energy savings through ESCOs in the domestic sector according to their second NEEAP (Republic of Bulgaria 2011). These projects usually (but not always) combine some form of national or EU financial incentive with the ESCO

¹⁴⁴ Financing energy Refurbishment for Social Housing (FRESH) is a European co-operation project that aims to pave the way and demonstrate to Social Housing Operators that Energy Performance Contract can be used for low energy refurbishment on a large scale. See more at <http://www.fresh-project.eu/project/>.

technical realisation; therefore, a pure market based solution is not always available. Nevertheless, the contracts are often guarantee based, i.e. the main role of the ESCO is to support the project with a guarantee.

Motivation of concluding ESCO projects

The primary driver of an ESCO project is the economic gains from the investment. The client saves on energy costs, while the ESCO (and other contractors, financial players) raise profits. This approach has been leading promotion and information dissemination. While profits are key to most of the ESCO projects, there are cases when other motivations also exist or outforce pure economic benefits.

The focus of the ESCO contract has been shown to shift when it is concluded between a client and an energy service provider that is not for clear-cut profits. While we tend to consider ESCO projects as marketable on their own, it is increasingly common to engage in the field due to a mix of additional motivations:

- on the client side:
 - **improvement of image** (since energy efficiency and climate change have a positive connotation);
 - **general renovation**, which is then combined with the energy system revamping;
 - improvement of **comfort**.
- on the ESCO side (especially in case of energy producers, distributors, equipment installers, etc.)
 - Trigger **loyalty** of the customers and thus improving the position of core products;
 - **Attract more customers**;
 - Comply with **regulations**.

If these two motivations prevail, the ESCO-type investment can be cross-subsidised by the main product(s) of the contractor or from the client side (e.g. it can be added to the general renovation cost).

Success factors

There are a number of important drivers behind the above described market growth and transformation. The most important success factors are listed and explained below. In the period under observation, 2010-2013, it could be concluded that a factor may be an important driver in the development of the ESCO market in one environment (e.g. the dedicated ESCO measures in Sweden (Forsberg, Lopes, and Öfverholm 2007)), but may lead to only little change in others (e.g. in Spain the dedicated ESCO legislation and public programmes have not achieved major results as had been expected, on the other hand promotion by the supply side has increased the ESCO market).

1. Legal and political drivers

1.1. **Long-term, manifested and credible commitment** by the government and/or the public administration to sustainable energy, energy efficiency and/or directly to the ESCO concept is amongst the key factors that can kick-start a market. For example in Denmark, a strong energy efficiency regulatory framework has been linked with an announced commitment to the ESCO solution by local administrations. There is a large number of ESCO markets today that are backed with a politically united, strong pledge.

A vehicle of this message could be the **NEEAPs, the SEAPs, or other official energy plans, strategies** that do not depend on, for example, election cycles. Such a commitment ensures a safe business environment, and therefore longer-term thinking by both ESCOs and clients, and provides for lower transaction costs.

1.2. **Supportive policy framework** is inevitable for the establishment and development of the ESCO market. When comparing the national markets, a general corroborative energy efficiency or sustainable energy regulatory background helps more than specific ESCO rules. For example, in the Netherlands ESCOs are not mentioned in legislation, nevertheless the general framework ensures that the energy services market can operate with a growing success. In Romania, ESCO and EPC are defined in law, but secondary legislation is still missing. In Switzerland, stakeholders believe that the direct promotion of the market by policies is not necessary, because by removing general legal hurdles the market can be expected to increase.

On the other hand, there are markets where market players do expect dedicated support or legal definitions, and where the general energy efficiency support is/was not enough (e.g. Denmark, Norway, Latvia, Slovenia, etc.). Certification, transparency, information dissemination are amongst the functions stakeholders expect from dedicated legal acknowledgement or measures.

1.3. **Dedicated ESCO legislation and measures** have increased throughout Europe. While the ESCO Status Report 2010 (Marino et al. 2010) concluded that the number of policies and actions set up with the objective of directly supporting the ESCO market were limited, the opposite can be seen between 2010 and 2013. Around one third of the EU/EEA countries enjoy dedicated ESCO rules. These may be in the format of providing an official ESCO definition, an ESCO certification scheme, standards, or establishing financing support for ESCO projects, or encouraging (even mandating) ESCO contracting for public authorities. The level of success of these measures varies widely, though. Successful policy package was introduced in Greece (the 3855/2010 law describes the context and principles of an EPC, provides a model contract and prescribes the allocation of obligations and responsibilities between the ESCO and the client). In Italy the Legislative Decree 115/2008 is the most relevant legislation for ESCOs, and it defines an ESCO, the energy service and the energy service plus contracts. The Law on the Efficient Utilization of Energy in Final Consumption (adopted in 2008 and reviewed in 2012 OG 158/08 and OG 55/12) is the legal basis for energy services and ESCO operation in Croatia. On the other hand, Cyprus and Spain put forward a complex set of policy measures; nevertheless it has not been enough to spark the ESCO market. For example, Spain launched several large-scale ESCO programmes (the “Plan 2000 ESE” and the “330 ESE Plan”), incorporated the definition of ESCO, an endorsement system, and the standard energy services into Spanish law in 2010, but the official programmes were delayed and have had problems and caused frustration in the market. The experienced market growth in Spain remains hence below expectations.

1.4. **Complementing measures** can also contribute to the success of ESCO markets. These are laws and regulations that are introduced for another reason, but have a positive “side-effect” on energy services. The introduction of **Energy efficiency obligation schemes** (EEO) is mandatory in EU Member States via the Energy Efficiency Directive (see more in “Background” section). While, there is disagreement about the level of contribution of EEOs to the ESCO market, nevertheless energy services have increased in the countries where an EEO has been introduced or the introduction is under discussion, e.g. in Denmark, Germany, Poland, Latvia, the UK, etc. In Slovenia, experts foresee a positive impact, but the system has been introduced only recently.

In fact, the impact of EEOs depends very much on their design. If energy companies (obligated parties) carry out energy services themselves, the system can be even competitive to market-based ESCO services. However, the system design may include the possible involvement of third parties, which will often be ESCOs. The possibility of trading certificates issued under an energy efficiency obligation scheme is often seen as a driver, e.g. in Italy and Poland . Acquiring energy efficiency certificates through an ESCO implemented energy efficiency investment increases profits, thus increasing the demand for ESCO projects.

1.5. **Removal of regulatory barriers** was pursued in several ESCO markets. In Spain public procurement rules are adapted to long term (such as ESCO) contracts as a result of the modified procurement law (Law 30/2007, modified in Legislative Decree 3/2011). Contracting processes have been made more dynamic and Article 11 of the Law defines the Public Private Collaboration Contract (PPCC) to suit best municipal conditions for ESCO projects (Rivas Puente and Puente 2011). Energy-efficiency criteria were developed to be considered in the tendering process (Boonekamp and Vethman 2010). Similarly, the Swedish procurement act opens the way for EPC by accommodating it in public procurement practices.

The introduction of **varied criteria in public tenders** that involve requirements beyond up-front investment costs, such as the consideration of life cycle costs, energy efficiency, social benefits, etc. is registered done in many countries. These tender evaluations are particularly beneficial for ESCOs. For example in Croatia, the Ordinance for Contracting and Implementation of Energy Services in the Public Sector (OG 69/12) created the legal conditions for energy service contracting in the public sector. The Ordinance recognises energy savings as an income for the building owner. In Finland a number of energy efficiency related criteria were introduced in the tender evaluation. However, applicants complain that as a result, the criteria are now too complicated and it is difficult to comply with the requirements.

The EBRD has a programme in Bulgaria and Romania to explore information about awareness raising, access to information about EPC, investigation of the legislative background, in particular procurement regulations and practices, as well as the general enabling framework and secondary legislation.

1.6. **ESCO and ESCO service standards** are able to improve the quality of the markets, partially because of the clear requirements towards the suppliers and because the clients can select trustful contractors more easily. The European standard of energy services was introduced in 2010. There are a number of countries, which adopted their own official ESCO definition or a standard. For instance, in Germany, there are a number of relevant standards, such as DIN EN 15900: Guidelines of energy efficiency services (03/2009), ISO 50001: Energy management systems - Requirements with guidance for use (04/2012), VDMA 24198: Terms and services of Energy Performance Contracting (explaining the stages of project development and giving criteria for the assessment of EPC services), and DIN 8930-5: Definition of different types of contracting (11/2003). In Italy, the UNI CEI 11352 standard certifies an ESCO.

2. Procedural factors, tools

2.1. **Tools, models and handbooks** have been prepared that can be used at various stages of the project implementation. The EU has financed several initiatives addressing problems, such as project preparation, decision support, monitoring and verification, and even tools for the financing institutions interested in ESCO projects. Furthermore, tools are put out by other countries as well as by businesses and facilitators around the world. Table 8 lists a few interesting examples.

Table 8. Examples of free tools that can be used in ESCO project preparation and in monitoring and verification of energy savings. The list is – by no means – exhaustive.

Project decision, preparation	Monitoring
Excel Calculation Tool for Assessing Customer's Profitability of Investment with ESCO Company – available at: http://www.biosolesco.org/financial_tool.html	IPMVP by EVO – available at http://www.evo-world.org/index.php?lang=en
“Is EPC right for you?” A test available in the Best Practice Guide – available at: http://www.eec.org.au/UserFiles/File/docs/BestPracticeguidetoEPC.pdf	A Best Practice Guide to Measurement and Verification of Energy Savings – available at: http://www.aepca.asn.au/
Energy Performance Contracts (EPC) Handbook by SEAI – available at: http://www.seai.ie/Your_Business/National_Energy_Services_Framework/EPC_Handbook/	Example of an M&V plan by the PERMANENT project – available at: http://eaci-projects.eu/iee/page/Page.jsp?op=project_detail&prid=1888&side=downloadablefiles
Step-by-step instructions for putting together an energy efficiency service – available at: http://www.changebest.eu/images/stories/deliverables/changebest_guide_ees_development.pdf	

2.2. **Standard documents** have been advocated by a number of countries, where these have been prepared and used with more or less success. In 2011, after a few unsuccessful ESCO procurement projects, an ESCO procurement guide for the public sector was developed in Finland in 2012 (Koski 2011). EU projects implemented in Spain, the UK, Ireland, Austria, etc. also put several model contracts on the table. The use of the model contracts is limited, but their success was particularly highlighted in France.

2.3. A notable development and important step towards a trustful ESCO-client partnership is when **flexibility** is ensured **in the content and the preparatory procedure** of a contract. This allows tailored services. In Denmark municipalities that consider entering an ESCO contract, often perceive risks as too high because many ESCO suppliers are unknown companies. This problem is overcome with a larger flexibility in the contracts, and municipalities may opt out at any time during the project timeline. In France the system of contracts, referred to as P1, P2, P3, P4 is also able to ensure a degree of tailoring. A similar system is used in Spain. In Lithuania and Poland the lack of flexibility in the contractual process was seen as a crucial barrier for ESCO projects.

2.4. Established **statistics system, data collection, the introduction of centralized data collection and management systems** have been found to decrease transaction costs, and therefore increase the accessible profits for ESCO projects. The Myenergy programme in Luxemburg is one key driver of the ESCO market. The building certificates introduced due to the transposition of the EPBD have been often referred to as core drivers, for example in Sweden, Portugal. In the Netherlands, Georgia, Armenia, and Albania¹⁴⁵, the effects of building certificates are expected to be seen in the future. The certificates can be used as baseline information. In Turkey, ESCOs are the primary suppliers of energy certificates of buildings, through which they can acquire larger projects. In Italy the “Energy Service Plus contracts” include an additional commitment by the provider to reduce the consumption of primary energy for winter heating by at least 10% with respect to what is indicated in the building certificate.

¹⁴⁵ Building certificates have been introduced on a voluntary basis in this country

3. Financing

3.1. A number of **EU and national level grants, financial incentives, preferential loans** have been identified that were used during the period 2010-2013. In the Czech Republic ESCO projects have been regularly combined with operational programmes (CombinES project n.d.), which has proven effective and has increased the achievable savings from 20-30% to 40-50%. The EPC+ contracts combine the ESCO contract model with state grants and forfeiting, to finance large scale renovations of multiapartment buildings that are in particularly obsolete state (Government of Latvia 2011).

These national and local financial grants may be destructive to the ESCO markets, especially when they are non-refundable, because they compete with market based instruments, e.g. in Bulgaria, Hungary, etc.. On the other hand, credit lines from IFIs and national governments have been seen as a key success factor in kick-starting ESCO markets. Currently, they are very common in non-EU countries. Governments may want to differentiate between loans and grants available for clients and for ESCOs (in Germany and in Hungary), or may not specify who can apply for the support (in Latvia).

The “green fund” in the Netherlands is a preferential loan with 1% discount on the interest rate for ‘green’ investments available to be combined with an ESCO model (EC JRC 2012; De Boer et al. 2011). Usually, municipalities have access to preferential loans, and therefore ESCO projects are largely client financed in Croatia and Denmark (as opposed to Germany, where municipalities are not prioritized in this way).

3.2. **Third Party Financing** (TPF) has increased, but it is still on average used only in one out of 10 projects. Since preferential loans are not available in Germany, financing is provided by banks, which are particularly active in this country. The openness of the financial sector has increased in several countries, including the Czech Republic.

4. Information and awareness

The ESCO concept is increasingly recognised by authorities and considered as a valid alternative to own investment, leasing and other traditional practices by clients. The knowledge and understanding of the various ESCO models is also growing. As a result, in several countries, promotion efforts are not wasted on explaining the general benefits of the model, but rather new contract forms and flexible conditions can serve the needs of the individual clients better.

4.1. **Motivation** to refurbish sites, properties and buildings seems to increase. Energy efficiency investments are often driven by **regular refurbishment**. The experience of the municipalities that engage in an ESCO project in Denmark shows that the measures are done **quicker and at a cheaper price**. Some municipalities do not possess the appropriate capacities themselves.

Environmental and climate awareness has increased at all levels. This has motivated policies on the governmental levels, and participation in projects at the client sides. In Scandinavia, one of the main drivers of ESCO (and other energy efficiency) projects is public image and environmental concerns.

4.2. **Awareness raising** activities have boomed – all of the countries in the current report indicated running awareness raising and information dissemination activities between 2010 and 2013. This activity was multiplied with the implementation of the EU EPC campaign, which visited all EU countries. The campaign highlighted the possibility to combine various climate and energy goals, as well as to combine available tools such as the ESCO concept and the **SEAPs**. The **Covenant of Mayors** has served as a key

driver, and as one of the main success factors in the Netherlands, Denmark, Cyprus, Croatia, but also in non-EU countries, eg. in Belarus, Ukraine, BiH, and Georgia.

5. Structural and market related changes

5.1. **Energy price** is one of the main factors influencing the demand of energy efficiency investments and therefore ESCO services. The steady rise in energy prices and energy taxes has improved the payback time of energy efficiency investments and increased the importance of energy efficiency in cost competition. The rise in energy prices has also increased the interest in energy conservation for non energy intensive energy consumers. These can be combined with energy tax rebates (France and Italy) to further increase the profitability of ESCO projects.

These measures are being considered also in Moldova, Kosovo and Russia.

5.2. The collapse of the construction sector was among the most significant barriers in 2010. Reflecting this, the **recovery of the construction industry** is currently a major driver and can be expected to contribute to an increase of ESCO projects both through the demand and the supply sides. In the Czech Republic less profitable types of measures (e.g. insulation) could be combined with profitable ESCO measures based on the increase of the construction activities and to reach deeper renovations. In the Netherlands, general renovations are extended to energy efficient refurbishment, too.

In Denmark and Hungary, the decline of the construction sector has induced construction companies to search for new market niches, and thus enter the ESCO business.

5.2. The recent intensive proliferation of **ESCO associations** has meant a growing capacity to support the ESCO markets. In addition other types of **facilitators** also appeared and intensified their activities. As it can be seen in Table 7, about 40% of the EU ESCO markets enjoy the support of an association that is able to represent the companies. The establishment of ESCO associations has partly been supported by public authorities. The creation of ESCO association enables a market establishment with important activities, such as standardization and quality control efforts, dissemination of information and capacity building lobbying.

5.3. In countries where projects and project development processes can be better tailored, and can be built up in a step-by-step basis, ESCOs have gained power. Progressive projects are common in France, i.e. a client starts with a smaller project, and when trust has established, the client purchases the next service level or involves further buildings in the project. One successful project stimulates the contract for another.

“Negotiated agreements” have been used in Belgium. After the tender is won by one company, projects are finalized through a “competitive dialogue”.

5.4. Parallel **development of information and communication technology** was a driver in the Swedish ESCO market. The boom of **smart technology**, used in the energy management of buildings is predicted to pull several ESCO markets along.

Barriers

The list of barriers has not changed significantly since 2010 throughout Europe, and all of the countries carry on to struggle with certain limiting factors. On the other hand, the observed growth and development is the result of successfully eliminating or decreasing one or more major barriers. The most important and common barriers are discussed below.

1. Legal and political barriers

1.1. **Erratic and incalculable legislation** can block ESCO markets. In an economy where laws change rapidly, without (proper) public and expert consultations and not allowing enough time for the business sector to prepare, long-term contracts, such as ESCO contracts are not viable, because of the high risks associated. Such wacky legislation has hindered the markets of Hungary, Slovenia, Italy, and Spain.

If national financial grants are commonly used for energy efficiency renovations, however the announcement of the grants and the volume of their budget are rhapsodic, clients will put their bankable projects on hold to wait to see if at least parts of the investments could be covered from the appearing grants. This is the case in Hungary and Latvia, where the risky legal environment and the incalculable financial support have had a major role in the decline of the ESCO market.

1.2. The **lack of official and/or generally accepted ESCO definition and/or certification scheme and/or standards** hinders the ESCO market. While there is an EU-wide definition for ESCOs, in many countries, it is the company that decides whether to refer to itself as ESCO or not. This has caused significant confusion in the Netherlands, Croatia and other West Balkan countries. Often the notion of ESCO is popular, even if the company does not actually deal with energy services. On the other hand, in France, the number of ESCOs is underestimated because more general contracts often involve elements of ESCO services, even if the whole contract is not an ESCO contract.

In both cases, the clients are confused, and it is unclear for them what ESCOs really offer. This situation reduces trust in the ESCO solution, and customers will be mistrustful with approaching companies or even with facilitators.

1.3. There are a number of examples of **contradicting interpretation of legislation** regarding the ESCO businesses. For example in Sweden, there is no common agreement whether a municipality-owned energy company is allowed to offer energy services outside their municipality of origin or not. Today, practice varies, and therefore some municipalities allow their companies to operate throughout the territory of Sweden while others restrict their activities to one municipality (SEA 2012). Public institutions in the Czech Republic are often afraid of using EPC because of the unclear rules (e.g. about project registration, approval and accounting).

The lack of acceptance of the ESCO concept by the public financier is a crucial issue. In the Czech Republic, the so called “organisational units of the state” (OUS) are not able to apply EPC because they are legally bound not to receive or provide grants based on the Act no. 218/2000, Section 49. The Ministry of Finance, which administers these OUSs, even considered EPC as an act of “cheating”. The Heat Supply Act does not allow selling services, i.e. comfort as a commodity in Slovakia.

1.4. **Procurement** related barriers used to mean the central hurdles for ESCO projects. As of 2013, many of the national legislations have resolved the tendering and the public management of EPC projects. Nevertheless, problems do remain. There are still a lot of countries where the savings in energy costs cannot be transferred into another budget line, such as operation or human resources.

A common problem to several countries (e.g. Italy, Hungary, Sweden) is that the company that has carried out the feasibility study (baseline audit) cannot participate in the competition for the renovation project. This either impedes the contracting of one/several relevant companies, or the partners use “grey” solutions (e.g. the establishment of a new “vehicle” company only for the preparation phase) that may also be the ground for corruption practices. On the other hand, in Belgium a solution has been found through the use of negotiated agreements (see at the drivers section).

Procurement laws and practices are deemed as too complex in Cyprus, completely blocking the initiation of ESCO projects. But this problem is also evident in Croatia and Finland, even though procurement practices are also considered as drivers there.

2. Institutionalization and project tools

2.1. The **lack of facilitators** is considered as a market gap, i.e. without facilitators some ESCO markets cannot be started. For example, in Cyprus and Malta, neither the supply, nor the demand side has been able to push the market through its tipping point.

2.2. The **lack of proper measurement and verification practices** is a problem. Without a credible method to prove energy savings, projects can be debated by the participants. This has led even to court cases (Latvia), or failed projects (Sweden). Measurement of projects where the public budget is also involved, because of a grant, is imperative. For example in the Czech Republic, the Kozloduy Fund does not use reliable measurement and verification system and therefore the appropriation of the financial grant can be debated. A similar situation has been registered in Hungary with the Panel Programmes and other building renovation programmes that required a certain level of energy performance improvement which was not checked or certified.

3. Financial barriers

Finding financing and/or appropriate financing solutions remain a common barrier. Although TPF is used more often than before, according to EEVS (2013) only 1 out of 10 ESCO projects incorporates external financing. In the other cases, either the ESCO or the client will provide the budget for the project.

3.1. The most regularly referred problem relates to the **accounting of EPC projects as loans** by public authorities. This has two consequences.

On one hand, municipalities and other authorities are not allowed by their government to participate in ESCO projects, because these are considered to fall under the **EUROSTAT methodology ESA 95** (European System of Integrated Economic Accounts), and therefore are added to the value of the government debts, which are on the other hand limited by the EU legislation (Directive 2011/85/EU on requirements for budgetary frameworks of the Member States and related regulations). At the moment there is no satisfactory solution for this, although some countries (e.g. Denmark) do not consider municipal ESCO projects as loans. But most of the countries either clearly interpret the EUROSTAT methodology as a barrier to ESCO projects (e.g. Slovakia, Czech Republic, Poland), or do not clearly take a stand (Spain).

The other problem is that **liquidity** and **credibility** of the public administrations are limited, especially after the financial crisis. Therefore they are reluctant to take “loans”, and/or banks are reluctant to offer loans to them.

3.2. The classic problems with **banks** remain, i.e. **low awareness and motivation**. Nevertheless, there are a number of ESCO financial products, which are seriously underutilized. In Hungary, about 3-4 banks have ESCO-related products, which are not utilized because the application process has several requirements which are either not possible to comply with (deadlines, list of administrative documents, etc), or the costs and/or effort would be too high compared to the benefits of winning the loan.

3.3. There is a strong **aversion to loans** by potential ESCO clients, especially by the public administration, the private residential and the private tertiary sectors. During the financial crisis, accessing loans that were very hard to repay was so general that even entities that did not take part in this problem are

afraid to get engaged with loans. They fear that the financial crisis situation can repeat, and loan repayment seems to them too risky. At the same time, banks are also much more careful in selecting the safer partners, and from their point of view an ESCO project is irregular, and thus unsafe.

3.4. **High transaction costs** remain to block the start-up of ESCO markets. ESCOs still prefer large projects, that have a better cost/benefit ratio. At the same time, pooling (or bundling) has gained more and more popularity, and is done in Austria, Germany, Luxembourg, etc. In Denmark, an average of 60 buildings can be found in a pool.

On the other hand, smaller ESCOs struggle to find the way in-between. In Sweden, clients prefer tenders for projects with a value of less than €56 million, in order to avoid the complicated EU level procurement.

4. Market and partnership problems

4.1. There is still some **lack of trust by the clients** in the markets, although a lot has been done to overcome this barrier (see “drivers” above). Lack of trust usually originates from inhomogeneous ESCO offers in the market, lack of competition, lack of experience of clients, ESCOs and financial institutions, absence of credible and visible reference cases with a clear client focus, unclear definitions and failed contracts, unstandardized measurements and verifications.

Lack of trust is among the key barriers in the non-EU countries covered, and this problem is highly ephemerized in the West Balkans and post-soviet countries, because of fear for corruption.

4.2. **Lack of well-established partnerships** between ESCOs and sub-contractors was also identified, as well as mistrust from the side of contractors towards clients, due to an increased risk of unstable and insolvent customers. Furthermore, partnerships between the ESCOs and subcontractors were marred as a result of financial difficulties of the construction sector in general, whereas many previously reliable companies went bankrupt or had to change business.

4.3. **Failed projects** have been seen to affect the markets very deeply. Even one critical project may undermine the successes in a short time. For example, in Sweden the ESCO market has decreased radiacly in 2009 due to an EPC procurement in Stockholm, where disagreement between the parties could not be resolved. The effects of this dispute were negative on other companies, created mistrust in the EPC business model (Energimyndigheten 2011) and market recovery is slow since then. In Finland public procurement rules were not always followed properly, and the projects had to be stopped for investigation or be cancelled. In Latvia, a project was taken to court due to the disagreement about the results of the project. The same happened in Hungary and has contributed to a bad reputation for other companies that have to restart market information campaigns and building up trust.

Comparison of barriers

Even markets with a successful ESCO market experience barriers. However these are more often related to the natural features of the markets, while legal obstacles are smaller, financing is usually solved and awareness is not a major problem (Figure 6).

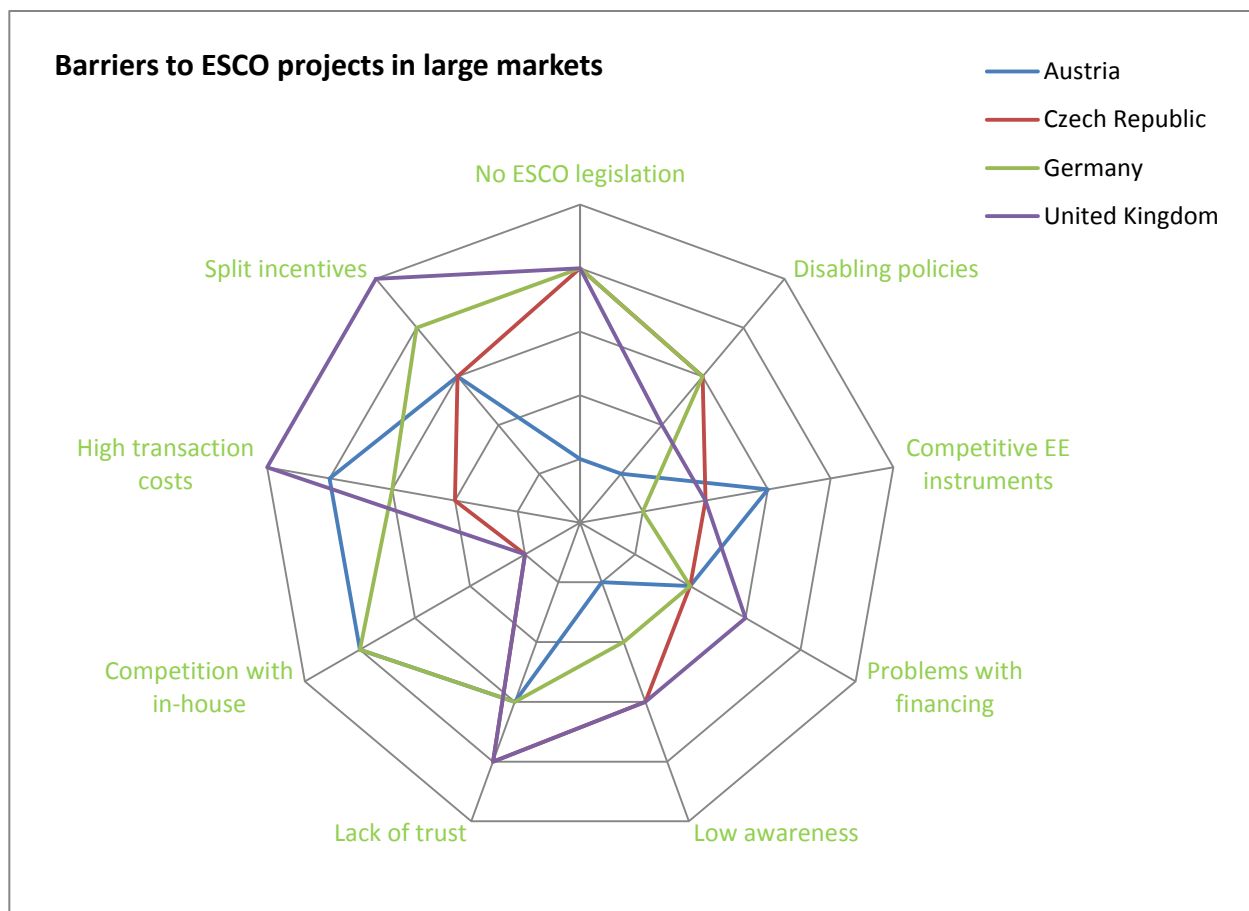


Figure 6. Comparison of barriers to ESCO projects in large markets.

On the other hand, the opposite can be observed in countries where the number of ESCO companies and the volume of projects are small or these have been decreasing lately. There is a lack of supportive legislative frameworks and/or there are disabling policies in these countries. In addition financing is a problem, sometimes in the form of high transaction costs. As a result, trust is low. Other tools for energy efficiency are either non-existent or compete with energy services (see Figure 7).

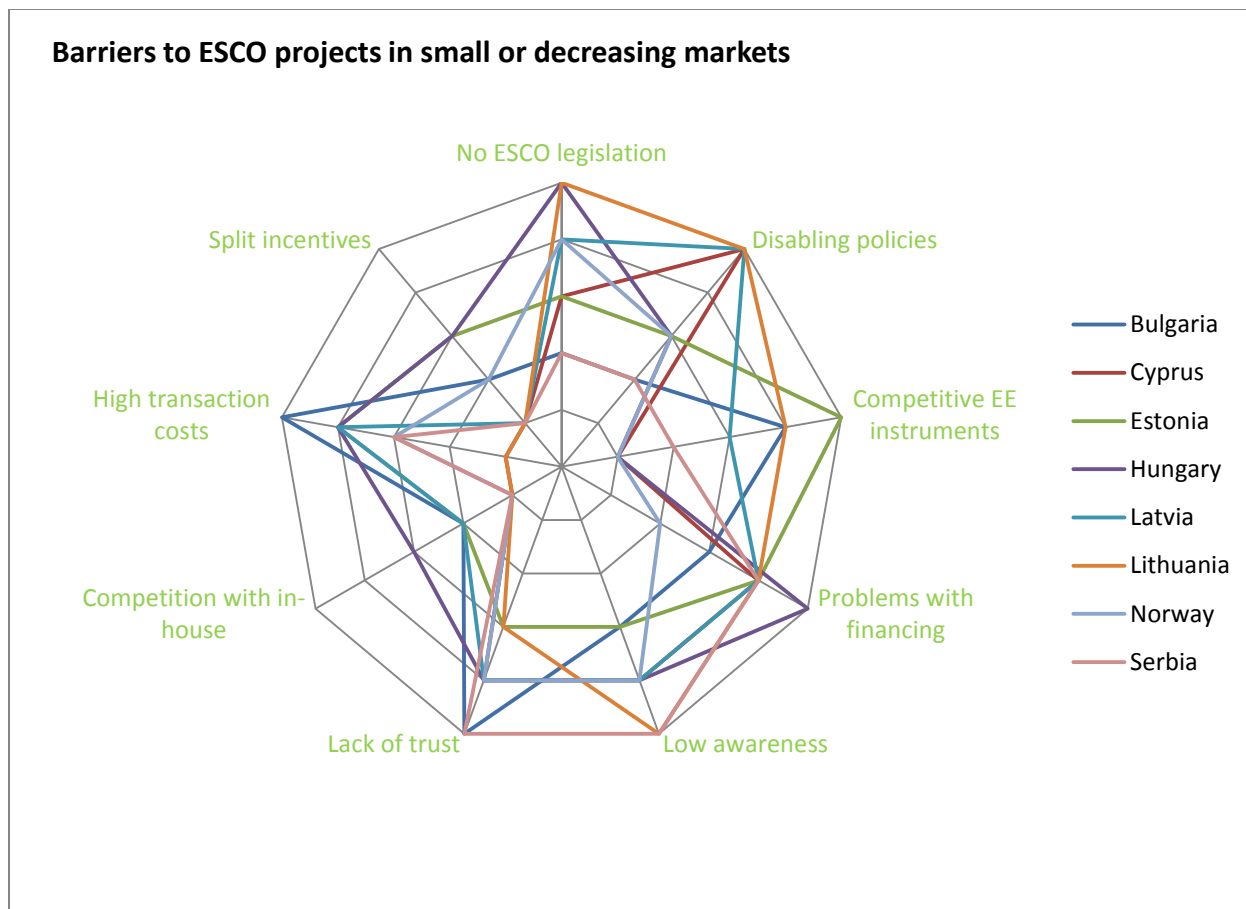


Figure 7. Comparison of barriers to ESCO projects in small or decreasing markets.

Conditions for ESCO markets maturity

The European ESCO markets have been undoubtedly developing both in terms of volume and in complexity when compared to the findings of the 2010 or the previous ESCO status reports. Based on the analysis of the success factors of the markets across Europe, it is possible to collect a list of conditions and features that can possibly define a mature market. Such a list also indicates the likely directions of market transformation and the generally expected areas of improvement if a more functional ESCO sector is targeted.

Clearly, the list reported below should not be intended as an exhaustive list of necessary conditions for ESCO markets maturity. It is normal that a mature market can build up with only a combination of some of these features, or thanks to other specific context dependent conditions.

That being stated, the conditions for a mature ESCO market can generally be described as follows:

- the ESCO concept is **known and understood**. Clients will still need additional information about the specific offer and contract types offered by suppliers, but a decision between own investment, ESCO project, outsourcing, etc. is done internally. The additional information is available from consultants, independent facilitators or public agencies;

- the market is **demand driven**, meaning that (potential) ESCO clients actively search for suppliers, and define their needs and requirements for an energy services project or package, announcing them and waiting for alternative solutions, which can be compared to each other;
- there are **alternative contract forms**, several of them available in a standard format or supported by guidebooks that have been prepared by an independent organisation with the involvement of market stakeholders.
- there are **alternative financial solutions**, including client-financing and bank involvement.
- **transaction costs are low**, historical data on energy consumption are available;
- **monitoring and verification** of savings is carried out with a standard and transparent method;
- there are **facilitators**, who can help clients decide about the available offers, while supporting the supplier side by undertaking lobbying activities, general promotion, training, certification, etc.
- the energy and procurement general **policy framework does not hinder** ESCO projects and there is rarely a need for dedicated legislation for ESCOs. Nevertheless ESCO definitions, standards, and sometimes specific laws can be necessary. On the other hand the ESCO solution will be the route to a sustainable economy (energy consumption) and not the goal of a legislation;
- **grants or preferential loans** – if available – **do not favour, nor disqualify ESCOs**. They should be **gradual** and provide non-refundable subsidies only for measures that have a very long payback time (i.e. would not be financed by market players), but are socially beneficial, and that are combined with more attractive measures in order to achieve e.g. deep retrofit or complex project or favour special social groups, etc.

Finally, while governments and public administrations often aim at developing the ESCO industry, this should be done in order to achieve energy savings or sustainable energy use, not for the sake of the industry itself. Policies and measure should indeed be aimed at socially beneficial ESCO market impacts and/or at the deepening of these impacts. Otherwise, the risk is that they can obstacle or not allow to fully exploit the positive outcomes linked to the ESCO business.

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Abbreviations

AEEG – The Italian Energy Authority, Autorità per l'energia elettrica il gas ed il sistema idrico

b - billion

BiH - Bosnia and Herzegovina

CO₂ – carbon dioxide

EBRD - European Bank for Reconstruction and Development

EC – European Commission

ECLO - European Commission Liaison Office

ECT - Energy Community Treaty

EEA - European Economic Area

EED - Energy Efficiency Directive, 2012/27/EC

EEE-F - European Energy Efficiency Fund

EESI - European Energy Service Initiative

EIB - European Investment Bank

ELENA - European Local ENergy Assistance

ESC – energy supply contracting

EPC – energy performance contracting

EPCC - EU Energy Performance Contracting Campaign

EPEC - European PPP Expertise Centre

EPRP - Energy Performance Related Payments

ESCO – energy service company

EVO – Efficiency Valuation Organisation

FYROM - Former Yugoslav Republic of Macedonia

GEF – Global Environmental Facility

GIZ - Gesellschaft für Internationale Zusammenarbeit

GTZ - Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (the precursor of GIZ until 2010)

HBOR - Croatian Bank for Reconstruction and Development

HEP - Hrvatska Elektroprivreda (the Croatian producer and distributor of energy)

HEP ESCO – the subsidiary ESCO of HEP

IBRD - International Bank for Development and Reconstruction

IDEA – Instituto para la Diversificación y Ahorro de la Energía, the National Energy Agency

IEC – Integrated Energy Contracting

IFC – International Finance Corporation

IPMVP - International Performance Measurement and Verification Protocol

JRC – Joint Research Center

KfW - KfW Bankengruppe

LED - light-emitting diode

MEEP - Montenegrin Energy Efficiency Project

NEEAP – National Energy Efficiency Action Plan

NEF - National fund for Energy Efficiency in Belarus

NREAP - National Renewable Energy Action Plan

m - million

PDA - Project Development Assistance

PPP – public-private-partnership

RE, RES – renewable energy (sources)

REEP - Regional Energy Efficiency Program for the Western Balkan

SEAI - Sustainable Energy Authority of Ireland

SEAP - Sustainable Energy Action Plan

SSE - Energy Services Enterprises, used in Italy

SME – small and medium sized enterprises

SPV – special vehicle company

TF EE - Task Force on Energy Efficiency

UNDP - United Nations Development Programme

VAT - value added tax

VEB - Vlaams Energiebedrijf, Flemish Energy Company

WB – World Bank

WBIF - Western Balkan Investment Framework

WeBSEFF – Western Balkans Sustainable Energy Financing

Annex: ESCO survey 2012

The survey was available online at: <https://www.surveymonkey.com/s/JRC-European-ESCO-Survey>

European ESCO Market Survey 2012

Introduction

The European Commission, JRC regularly publishes the European ESCO Market Report (see <http://iet.jrc.ec.europa.eu/energyefficiency/esco>). In preparation of the European 2012 update, we are collecting information on the latest ESCO market developments in Europe.

To this end, I hope you are willing to share with us your knowledge of your national ESCO market and/or information about your ESCO business experiences and will reply the questions below. The information and data provided will be solely used for research purposes to prepare a public report. These public reports are targeted at policy makers and at European ESCO market players. Please, indicate any data or information you would like to be kept confidential in the comments.

Please feel free to forward the link of the questionnaire to other ESCOs/ESCO experts, for them to provide us with information in order to collect the widest range of information and opinion.

Thank you and best regards:

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European Commission DG JRC

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Fax. +39 0332 78 5869

EMAIL: paolo.bertoldi@ec.europa.eu

Please note:

1. As the survey requires some time to fill out, please make sure that you dedicate enough time to complete it in one go (approx. 20 mins. - 40 mins.), or be sure that the time-out setting on your browser is disabled.
2. For any problem relating to the survey please write to: jrc-escosurvey@ec.europa.eu
3. All questions with (*) asterisk in front are mandatory.
4. The Survey is best viewed using MS Internet Explorer or Mozilla Firefox.
5. Once the survey is completed you will be redirected automatically to the start of the survey.

JRC PRIVACY STATEMENT

1. Description.

The Joint Research Centre (JRC) is subscribing to the Survey Monkey website in order to collect data for the creation of the 'European Energy Service Companies (ESCOs) Report'. Your personal data will be collected and further processed for the purpose detailed hereafter under point 2.

This processing of personnel data has been notified at JRC corporate level and is under the responsibility of the

Head of Unit Internal and external communication at the JRC, acting as Controller. The specific ESCOs Report is under the supervision of the Head of Unit of Renewable Energies at the JRC.

The personal data are collected on a voluntary basis and according to conditions as provided by Survey Monkey (see the Survey Monkey Privacy policy and Terms of Service).

As this processing collects and further processes personal data, Regulation (EC) 45/2001, of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data, is applicable.

2. What personal information do we collect, what is the legal basis, for what purpose and through which technical means?

The main personal data of participants are the names and e-mail addresses of the people working in the energy service market.

The Legal Basis of processing are:

- In what concerns the legal basis of the processing, the data collected through a voluntary basis will solely be analyzed for the creation of the "Energy Service Companies Market in Europe Status Report 2012" that will be published by the European Commission only.

- Registration and participation of data subjects are provided on a purely voluntary basis.

The purpose of the processing of personal data for the ESCO Report is to investigate the ESCO market in the EU Member States and neighbouring countries. To this end, the authors sketch the current status of national markets and identify changes that have occurred during 2007-2010. In addition, the factors influencing the developments observed are investigated. Specific barriers are described and potential policy interventions to increase energy efficiency investments and to exploit energy saving potentials through ESCOs across Europe are discussed. The primary territorial scope of the report is the European Union (EU-27) and neighbouring countries. As technical means, the user data are collected through web forms and a backup of data is kept at JRC.

3. Who has access to your information and to whom is it disclosed?

The access to the site is only granted through user_id / Password to a defined population of users. No personal data is transmitted to parties, which are outside the recipients and the legal framework mentioned.

4. How do we protect and safeguard your information?

The collected personal data is stored on the servers of Survey Monkey (see privacy policy on the Survey Monkey security).

5. How can you verify, modify or delete your information?

Users are able to request to update the information submitted or to cancel their submission or request to be excluded from the report by writing to jrc-escosurvey@ec.europa.eu

6. How long do we keep your data?

The use of Survey Monkey is planned for the duration of the creation of the ESCO Report.

7. Contact Information

Should you have any queries concerning the processing of your personal data, please address them to the Controller or the Supervisor at jrc-escosurvey@ec.europa.eu

On questions relating to the protection of personal data, you can contact:

- DG JRC Data Protection Co-ordinator: jrc-data-protection-coordinator@ec.europa.eu

- Commission's Data Protection Officer: data-protection-officer@ec.europa.eu

8. Recourse

In the event of a dispute, you can send a complaint to:

- European Data Protection Supervisor: edps@edps.europa.eu

The survey

Note: We understand an ESCO as a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.

1. Please provide the following personal data so that we can contact you for follow-up and in order to share the report with you when ready. You can indicate your privacy requirements below.

Please provide the following personal data so that we can contact you for follow-up and in order to share the report with you when ready. You can indicate your privacy requirements below. *Name & Surname:

***Company:**

Address 1:

Address 2:

***City/Town:**

State/Province:

ZIP/Postal Code:

***Country:**

***Email Address:**

***Phone Number:**

2. Privacy options

Privacy options You do not agree that we list your name and affiliation in the acknowledgement section of the report (your e-mail will not be published).

You do not agree to be contacted for follow-up/clarifications in regards to your answers

*3. What is your affiliation type? (Check all that apply)

What is your affiliation type? (Check all that apply) ESCO (a company whose core activity is providing ESCO services)

Other company, which offers ESCO solutions among others (eg. construction company, engineering enterprise, real estate company, architect, etc.)

Utility with ESCO offers

Utility without ESCO offers

Energy agency

Governmental organization

Intergovernmental organization

Financial institution

Equipment manufacturer

- Equipment installer
- Facility or property management company
- Consultant
- Academic/research
- Other (please specify)

Please provide information about the ESCO market of a certain country

*4. Country of relevance: Please select the country in which your company/division is located:

5. How many ESCOs operate in the country of reference? Please give the latest information.

Note: We understand an ESCO as a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.

How many ESCOs operate in the country of reference? Please give the latest information. Note: We understand an ESCO as a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria. I don't know

Insert total number (eg. 500)

6. Which year is this data from?

7. What is the source of the above information?

What is the source of the above information? A survey, research (please give reference to the source and if available send us the electronic copy by email to paolo.bertoldi@ec.europa.eu)

An estimate (please specify if your own, or a generally accepted number or other)

Other (please specify)

*8. Has this number been changing significantly in the last 5-10 years? If so, how?

- Has this number been changing significantly in the last 5-10 years? If so, how? Yes, it has decreased
- Yes, it has increased

No, it remained stable

I don't know

8. a. Why did such a change/stagnation occur?

*9. Are ESCOs in the country of reference predominantly:

Are ESCOs in the country of reference predominantly: Local/national companies?

Part/sister/daughter companies of large international corporations?

There are no ESCOs operating in the country of reference, and ESCO projects are carried out by foreign ESCOs?

There are only one to few pilot ESCO projects (please give information in further comments below).

There are no ESCO projects.

9. a. Further comments

10. Has the above been changing significantly in the last 5-10 years? If so, how?

Has the above been changing significantly in the last 5-10 years? If so, how? Yes

No No

10. a. Why did such a change/stagnation occur?

11. What types of ESCO companies are present in the country of reference?

What types of ESCO companies are present in the country of reference? Building and control manufacturers

Facility management and operation companies

Consulting/engineering firms,

Energy service & supply companies?

Energy agency

Equipment manufacturer or supplier

Equipment installer

Other (please specify)

12. Which of the listed ESCO types is predominantly represented in the country of reference?

Please rank the ESCO types in order of importance in the country. You can indicate non-existent types by selecting "N/A" in the right.

public ESCOs

private ESCOs

public-private joint ventures

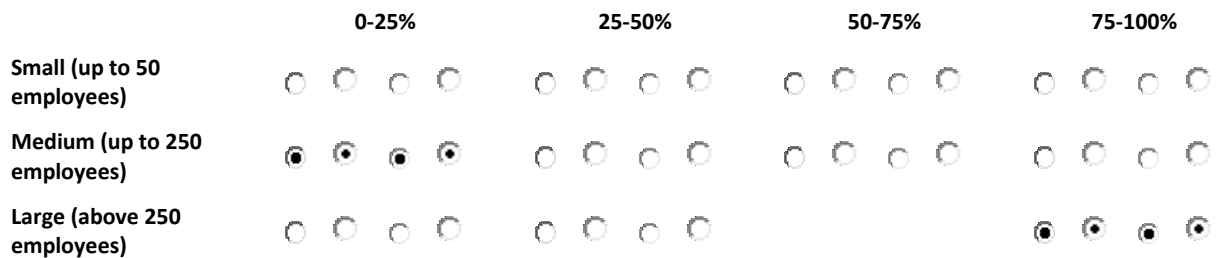
Other

*13. Where do ESCOs predominantly position themselves in the energy efficiency service value chain?
Multiple options are allowed.

- Awareness raising,
- Information and energy advice,
- Identification of measures,
- Technical planning,
- Financing and subsidies,
- Implementation (operation, supervision),
- Optimisation of technical operation,
- Saving measurement and verification
- Other (please specify)

14. How is the ESCO market divided amongst different actors according to their size? Please, indicate the approximate market shares per category and the approximate number.

Note: In case of large companies active in other sector than ESCO, the size should refer to the ESCO division.



*15. Has this market share significantly changed lately? If so, how?

- Yes
- No No

15.a. Why did such a change/stagnation occur?

16. Is the energy service provision of ESCOs in the country of reference predominantly:

- Is the energy service provision of ESCOs in the country of reference predominantly: Core business
- Or supplementary to other business activities (e.g. equipment manufacturing, energy supply, etc.)?

16. a. Comments

17. Has this changed lately? If so, how?

- Has this changed lately? If so, how? No
- Yes Yes

17. a. Why did such a change/stagnation occur?

18. Which are the most common type of contracts used by ESCOs in the country of reference?

**Note: Under an energy performance contracting (EPC) arrangement, the ESCO may use the stream of income from the cost

savings or the renewable energy produced from a determinate project to repay the costs of the project (including the investment costs).

- **Energy performance contracts (EPC) with Guaranteed Savings (ESCOs guarantee the energy savings, clients take the financial risk)
- **Energy performance contracts (EPC) with Shared Savings (ESCO and client share the savings, ESCOs take financial risk)
- Build-own-operate-transfer (BOOT)
- Contract energy management "chauffage"
- Other type of performance/energy based contracts (please specify specify type, eg. Energy contractship...)

19. What is the current size of the ESCO market (total value of current ESCO energy saving projects, expressed in Euro)? If not available please provide ESCO market size for the most recent year available.

- I don't know
- € (please use whole numbers)

20. Please describe the content of this value (e.g. only certain types of projects involved; only certain types of companies involved? The data includes energy costs or all construction costs and not only marginal costs, Etc.)

21. Which is the reference year for the market size indicated above?

22. What is the source of this information?

- A survey, research (please give reference to the source and if available send us the electronic copy by email to paolo.bertoldi@ec.europa.eu)
- An estimate (please specify if your own, or a generally accepted number or other)

22.a. Comments (please specify)

23. What is the potential size of the ESCO market (total value of possible energy efficiency projects in the building sector and industry expressed in Euro, with pay-back time of up to 10 years)?

€ (please use whole numbers)

24. Please describe the content of this value (e.g. only certain types of projects involved; only certain types of companies involved? The data includes energy costs or all construction costs and not only marginal costs, Etc.)

25. Which is the reference year for the ESCO market potential mentioned above?

26. What is the source of this information?



A survey, research (please give reference to the source and if available send us the electronic copy by email to paolo.bertoldi@ec.europa.eu)



An estimate (please specify if your own, or a generally accepted number or other)

26. a. Comments (please specify)

*27. Provide a development scale for the ESCO market in the following demand sectors according to the value/number of ESCO projects implemented.

Primary and secondary schools

Universities

Local administrations (municipalities, provinces, regions)

central government buildings

Health/Hospitals

Public housing/social housing

Hotels/hospitality

Office, commercial

Retail

Industry

Residential

military bases

Other

*28. Provide a preference scale for the technologies/fields of applications covered by ESCOs in the country of reference.

Building envelope insulation

Heating system (incl. DH), hot water system

Air conditioning

Ventilation

External lighting/public lighting

Lighting indoor

Building automation and control systems

User behaviour/staff training

Pumps

Electrical motors/inverters

Waste heat recovery

CHP

Renewable energy sources

Industrial process optimisation

Industrial cooling

Compressed air

Other

29. Please rank the impact of the most common barriers to ESCO projects in the country of reference (1 being very low impact and 5 being very high impact, i.e. solving this would be most beneficial to the market). Please do not assign any number to those barriers that are not relevant to the country of reference.

Lack of legislative support for ESCO business

Lack of appropriate forms of finance

Mistrust from the (potential) clients

Existence of in-house technical expertise in potential ESCO clients

Lack of standardisation

Inexperience of actors

Perceived business and technical risk

Small size of projects and high transaction costs

Other

30. If you have indicated the legislative framework as an important barrier, please select all applicable examples or specify others.

- Complexity and inflexibility of the public procurement rules,
 - Contractual arrangements specific to ESCO projects are “incompatible” with national contractual regulations and definitions,
 - The ESCO model is not recognised by the authorities as an individual business model providing a service, but as a contract for delivering goods,
 - International accounting rules (IFRS for operational and finance leases)
30. a. Other (please specify)

31. If you have indicated the lack of appropriate forms of finance as an important barrier, please select all applicable examples or specify others.

- ESCO projects are not profitable without state grants (please explain below which sector and why)
- Freeze in refurbishment investments
- Commercial banks do not have appropriate portfolios

31.a. Other (please specify)

32. If you have indicated the perceived business and technical risks as an important barrier, please select all applicable examples or specify others.

- The risk that energy efficiency interventions might compromise the production or operation processes related to the core business
- The aversion to outsource energy management
- The lack of flexibility and long commitment required with ESCo contracts
- The small size of projects and low priority of energy efficiency investments on the corporate agendas;
- Unstable potential clients
- Low and fluctuating energy prices
- The lack of reliable energy consumption data makes it difficult to establish baselines and hence provide reliable data on actual savings

32.a. Other (please specify)

33. Please specify any other barrier if applicable.

*34. What are the typical sources of financing for ESCO projects: (you can select more than one)

- Commercial banks lending to ESCO
- Commercial banks lending to the customer
- ESCO own equity
- Client internal funds
- State funds (e.g. revolving funds)?

34.a. Other (please specify)

35. Has the financial crisis impacted on financing for ESCO projects?

- Has the financial crisis impacted on financing for ESCO projects? No impact

Yes Yes

35.a. Please provide details, explanation

36. In 2012 how is the ESCO market developing in comparison to the period 2008-2010?

- Decreasing
- Stable
- Increasing at a faster rate
- Increasing, but at a slower rate
- Increasing at the same rate

36.a. Other (please specify)

37. Comments (please comment on why the market is developing in this manner and whether this change is relevant to the number of ESCOs, the number of ESCO projects, or the value/size of the market):

*38. Which, if any, EU or national programs or policies have promoted ESCO projects successfully?

- Energy Services Directive and/or Energy Efficiency Directive
- Renewable Energy Support Schemes
- CHP, Ecodesign or other Directive
- Covenant of Majors or other city level commitment
- White certificates
- Financial incentives,
- Taxation rules/rebates,
- Information and accreditation schemes
- Voluntary agreements
- Procurement rules (changes)
- Demonstration programs (national, public sector or voluntary programmes such as EU Green Building, Motor Challenge)
- Energy management roles, audit rules
- None of the above

38.a. Other, please specify

39. If possible, please provide details and/or describe, how?

40. Has the National Energy Efficiency Plan or Renewable Energy Plan had any effect on the development of ESCO projects?

- Yes
- No Yes
- No

40.a. Please comment

41. How much public (national and local) funding was available to support ESCO projects in 2011?

€ (please use whole numbers)

*42. What kind of EU or national programs or policies do you consider necessary for the further promotion of ESCO projects in the country of reference?

- Further EU Directive or National legislation
- Renewable Energy Support Schemes
- Joining an international/other city level commitment such as Covenant of Majors
- White certificates
- Financial incentives
- Taxation rules/rebates
- Information and accreditation schemes
- Voluntary agreements
- Procurement rules (changes)
- Demonstration programs (national, public sector)
- Energy management roles, audit rules
- Guarantee funds raised by national governments
- None of the above

42. a. Other (please specify)

43. If possible, please provide details and/or describe, how?

44. Do you have any other observations or comments related to the current status and recent developments of the ESCO market in the country of reference?

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