

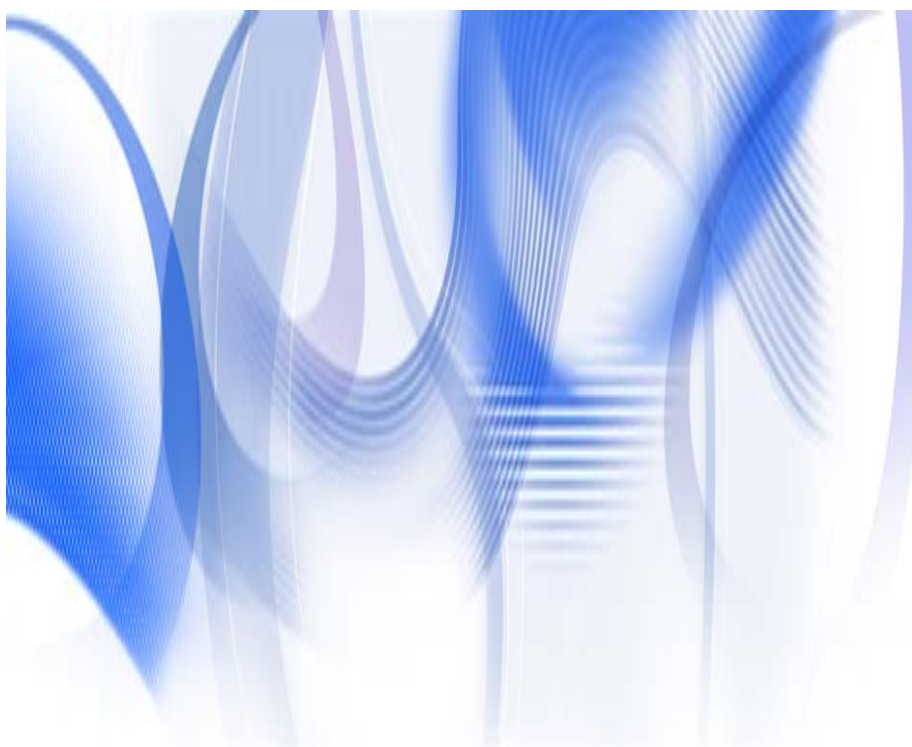


Energy Service Companies Market in Europe

- Status Report 2010 -

Authors: Angelica Marino, Paolo Bertoldi, Silvia Rezessy

Institute for Energy



EUR 24516 EN - 2010

The mission of the JRC-IE is to provide support to Community policies related to both nuclear and non-nuclear energy in order to ensure sustainable, secure and efficient energy production, distribution and use.

European Commission
Joint Research Centre
Institute for Energy

Contact information

Address: TP 450, I-21020 Ispra (VA), Italy
E-mail: paolo.bertoldi@ec.europa.eu
Tel.: +39 0332 78 9299
Fax: +39 0332 78 9992

<http://www.jrc.ec.europa.eu>
<http://re.jrc.ec.europa.eu/energyefficiency/>

Legal Notice

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server
<http://europa.eu/>

JRC 59863

EUR 24516 EN
ISBN 978-92-79-16594-8
ISSN 1018-5593
doi:10.2788/8693

Luxembourg: Publications Office of the European Union, 2010

© European Union, [2010]

Reproduction is authorised provided the source is acknowledged

Printed in Italy

Executive summary

The present report is an update of the work of the "*Latest Development of Energy Service Companies across Europe - A European ESCO Update*"¹ (herein referred to as "*Status Report 2007*") published by the European Commission DG Joint Research Centre in 2007 and which covered the European ESCO market development during 2005-2007. The first ESCO report of these series is "*Energy Service Companies in Europe - Status Report 2005*" (herein referred to as "*Status Report 2005*"²) published by the European Commission DG Joint Research Centre in 2005. The *ESCO Status Report 2005* gave an overview of the ESCO concept and key definitions, the development of the energy service markets across Europe, and a concise synopsis of the state-of-the-art in the European Union Member States at the time.

The aim of the present report is to update and 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. ESCO markets in Europe have been found to be at diverse stages of development. Certain countries (like Germany, Italy and France) have large number of ESCOs, while in most countries there are only a few ESCOs established and often complemented by engineering consultancies and energy efficiency technology providers offering solutions with some "ESCO elements" such as equipment leasing and performance guarantees.

A strong market growth has been revealed during 2007-2010 in Denmark, Sweden and Romania and to a smaller extends, in Spain, Italy and France. The most common trend across all countries in the scope of the present report is, however, a slow market growth. A decreasing market growth is experienced in certain countries (Austria, Croatia, Norway and UK). The financial crisis and economic downturn are identified as partly responsible for the slow growth in a number of countries. Changes towards a more favourable legislative framework focused on energy conservation, increased activity in the refurbishment of public buildings, financial incentives for refurbishment and modernisation of private real estate, and a stronger environmental awareness have been able to counterbalance the negative effect of the financial crisis in some cases. The legislative framework has in of the case of certain countries set the ground for important ESCO market development opportunities (Greece and Ukraine).

This complexity indicates that the field is very turbid and rapidly changing and new information is arising day-by-day. In this report we give a snapshot as of the end of 2009 and early 2010 of the national market and describe their development during 2007-2010.

¹ Available at: <http://re.jrc.ec.europa.eu/energyefficiency/pdf/publications/ESCO%20report-edition%20version.pdf>

² Available at:
<http://re.jrc.ec.europa.eu/energyefficiency/pdf/ESCO%20report%20final%20revised%20v2.pdf>

*This document does not represent the point of view of the European Commission.
The interpretation and opinions contained in it are solely those of the authors*

1. Introduction.....	5
1.1. Methodology	7
1.2. ESCOs in the EU until 2007	7
2. The European ESCO Market 2010.....	9
2.1. The European Member States	9
Austria	9
Belgium	11
Bulgaria	13
Cyprus	14
Czech Republic	15
Denmark.....	17
Estonia	19
Finland.....	20
France	22
Germany.....	26
Greece.....	30
Hungary.....	32
Ireland	37
Italy.....	38
Latvia.....	43
Lithuania.....	44
Luxemburg	45
Malta.....	45
Netherlands	46
Poland	48
Portugal.....	49
Romania	51
Slovakia.....	54
Slovenia.....	55
Spain	55
Sweden	58
United Kingdom.....	63
2.2. European Union Candidate.....	66
Croatia.....	66
FYROM (Former Yugoslav Republic of Macedonia)	68
Turkey	69
2.3. Other European countries	70
Norway	70
Switzerland.....	71
2.4. CIS countries	72
Belarus	73
Moldova.....	73
Russia	73
Ukraine	75
2.5. Non EU South East Europe	77
Albania	77
Bosnia and Herzegovina	78
Republic of Montenegro	78
3. Conclusions.....	81

3.1.	Latest developments	85
3.2.	Common barriers	86
3.3.	Success factors.....	89
3.4.	Recommendations for a further market development	93
4.	Personal Communication and Acknowledgements	97
5.	Appendices.....	102
5.1.	Appendix 1: List of abbreviations	102
5.2.	Appendix 2: ESCO Survey 2009.....	104
6.	References	106

1. Introduction

Energy service projects focus at the deployment of comprehensive solutions for improving energy efficiency and increasing the utilisation of renewable energy sources. Energy service contracts help to overcome financial constraints to energy efficiency investments by paying off initial costs through the future energy cost savings resulting from reduced energy consumption. Energy service providers offer an opportunity to curb increasing energy demand and control CO₂ emissions while capturing market benefits by decreasing clients' energy costs and making profit for themselves. Energy service companies (ESCOs) have been operational on a large scale since the late 1980s-early 1990s. However, as the present country analysis points out, the energy service market in the European Union (EU) and neighbouring countries is far from utilizing its full potential even in countries with a particularly developed ESCO sector.

The rationale behind the current study has been to update the *Status Report 2007* published by the European Commission DG Joint Research Centre, and to complete the picture of current ESCO developments in European countries. With the present report, the authors hope to provide professionals, policy makers and other interested parties a supplement and update to the *Status Report 2007*, with a spotlight on the developments and special features of the ESCO industry in each of the 27 EU Member States and neighbouring countries over the period 2007-2010. The report provides an overview of a total of 39 countries.

The authors found that information was occasionally hard to access or completely unavailable; therefore in case of certain countries the descriptions are less detailed. It has also been found that a comparison of ESCO markets is constrained by the fact that the notion of "Energy Service Company" is understood differently from one country to another, and sometimes used differently by experts even in the same country. This indicates the importance of common definitions that capture the diversity of energy service market developments in different countries.

Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on Energy End-use Efficiency and Energy Services (Energy Services Directive) has had a crucial role in establishing ESCO related terminology. Therefore, in this report, the following terms are used according to the Directive:

- **"energy service company" (ESCO):** 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;
- **"energy performance contracting" (EPC):** a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement;
- **"third-party financing" (TPF):** a contractual arrangement involving a third party — in addition to the energy service provider and the beneficiary of the energy efficiency improvement measure — that provides the capital for that measure and charges the beneficiary a fee equivalent to a part of the energy savings achieved

as a result of the energy efficiency improvement measure. That third party may or may not be an ESCO.

In addition, and in line with the *European ESCO Status Report 2005* and the *European ESCO Status report 2007*, the following terms also need to be defined for the purpose of the present report:

- In contrast to an ESCO, **"Energy Service Provider Companies" (ESPCs)** are natural or legal persons that provide a service for a fixed fee or as added value to the supply of equipment or energy. Often the full cost of energy services is recovered in the fee, and the ESPC does not assume any (technical or financial) risk in case of underperformance. ESPCs are paid a fee for their advice/service rather than being paid based on the results of their recommendations (WEEA 1999). Principally, projects implemented by ESPCs are related to primary energy conversion equipment (boilers, CHPs). In such projects the ESPC is unlikely to guarantee a reduction in the delivered energy consumption because it may have no control or ongoing responsibility over the efficiency of secondary conversion equipment (such as radiators, motors, drives) and over the demand for final energy services (such as space heating, motive power and light) (Sorrell 2005);
- In contrast to EPC, **"Delivery Contracting"** (DC, also known as Supply Contracting, Energy Supply Contracting or Contract Energy Management (CEM)) 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 – often expressed as percentage – of (monetary) savings, with a guarantee of the service provided. Alternatively, the customer may pay a rate, for instance, per square meter (EC DG JRC 2005). The ESCO (or ESPC) may also take over the purchase of fuel and electricity.
- **Build-Own-Operate-Transfer (BOOT)** contracts is a funding model which involves a organisation, or consortium designing, building, funding, owning and operating the scheme for a defined period of time and then transferring this ownership to an agreed party.

For further terms and definitions used in the current report (related to financial schemes, contract models and project elements), please refer to the *Status Report 2005*³. The rest of this report is organised as follows. Section 1.1 describes the methodology used for the preparation of the present report. Section 1.2 reviews some basic results of the *Status Report 2007* on ESCOs in Europe and supplements them with further information about the overall European ESCO market. The main body of this report is chapter 2, which presents the findings of the research carried out in 2009.

Every European country is presented in detail drawing up an overview of the ESCO market development, focusing on the timeframe 2007-2010. The final part, Section 3, summarises the trends identified in the market and draws conclusions about common barriers that hurdle ESCO market development. Success factors that facilitate the

³ Available at:

<http://re.jrc.ec.europa.eu/energyefficiency/pdf/ESCO%20report%20final%20revised%20v2.pdf>

uptake of the ESCO business model have also been identified. Finally, a set of recommendations is provided for a further ESCO market development.

1.1. Methodology

The principal methodology of the research was a combination of stakeholder interviews and large-scale surveying of ESCOs, international and national ESCO experts and experts in related fields, academia, and financial institutions. The content and format of the questionnaire was based on the survey used for the previous Status Reports. The information thus gathered was placed in the context of and extended by a document search and a thorough literature review. The list of interviews that were used for the compilation of the country reviews is indicated at the end of the report (see chapter 4).

The field research on the EU-27 and neighbouring countries was carried out mainly during 2009. Over 100 informative answers were received and interviews were conducted. We had an average of 2-3 expert opinions for each country. Country reports have been verified by experts and company representatives. 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.

1.2. ESCOs in the EU until 2007

The first companies offering services in the energy field and applying the ESCO concept appeared in Europe as long ago as the 1800s. The cradle of these so-called “operators” or “managers” was France (Dupont and Adnot 2004). The concept moved to North America and boomed during the 20th century (EC DG JRC 2005). Companies offering integrated energy efficiency solutions started to spread again throughout Europe in the 1980s (EC DG JRC 2007).

The *European ESCO Status Report 2007* describes a noteworthy difference in the development paths of the European member states, while the general trend is a steady growth with some stagnant domestic ESCO markets. A number of European Directives (such as the Energy Service Directive (2006/32/EC) and the Energy Performance of Buildings Directive (2002/91/EC)), European projects (such as EUROCONTRACT⁴ and Change Best⁵) have been promoting the ESCO and EPC market. A number of national governments have also been promoting energy savings through direct and indirect measures such as carrying out information and promotion campaigns, demonstration projects, development of guidelines, setting up standards and in some cases the establishment of public ESCOs (EC DG JRC 2007).

Most of the EU ESCO markets grew in 2005-2007 in comparison to 2004-2005 when the first European ESCO Status Report was prepared. A typical origin of ESCOs was heating and building control equipment manufacturers and retailers. Many multinational companies were active on the EU market. The most popular technologies used in ESCO projects as of 2007 were CHP, street lighting and heating (EC DG JRC 2007).

⁴ For further information please visit the following link: <http://www.european-energy-service-initiative.net>

⁵ For further information please visit the following link: <http://www.changebest.eu/>

The 2007 Status Report reconfirmed Germany as the largest and most advanced market, followed by France, UK, and Spain. In these countries the ESCO market expansion remained stable between 2005 and 2007. In 2007 the ESCO market had only recently emerged in the Czech Republic with the industry being significantly strengthened by concerted efforts of local actors (government, agencies and the providers) as well as international financial institutions. In 2005 the Swedish ESCO market was affected by a lack of trust due to previous negative experiences in the ESCO market together with Slovakia and Estonia (Forsberg et al. 2007, SEA 2003). However, by 2007 Sweden had undergone a spectacular increase in ESCOs activities thanks to a focused and comprehensive strategy designed for the local circumstances. In 2007 the ESCO market was still on the starting ground in Greece, Portugal, Ireland, Romania, Bulgaria and Estonia, while no significant ESCO activity existed in Poland, Slovenia, Cyprus and Malta (EC DG JRC2005, EC DG JRC2007).

The *European ESCO Status Report 2007* listed 10 major barriers in Europe:

- Low awareness of and lack of information about the ESCO concept;
- Mistrust from the clients;
- High perceived technical and business risks;
- Public procurement rules and accounting rules (including off balance sheet regulations);
- Lack of accepted standardized measurement and verification procedures;
- Administrative hurdles and consequently high transaction costs;
- Principal/agent dilemma with split incentives in the housing sector;
- Aversion to outsource energy;
- Lack of appropriate forms of finance;
- Low priority of energy efficiency measures.

Driving factors enabling the development of the ESCO market were also identified in the *Status Report 2007*. The liberalisation of the gas and electricity markets and increasing energy prices together with governmental support and capacity building were highlighted as having an important impact on the market development. Successful governmental support came in the form of dissemination of information, availability of subsidies for energy efficiency investments and dedicated state funds, and a supportive and favourable legislative framework (mandatory audits, energy efficiency certificates, climate change policies). Capacity building was found to be important in order to build a comfortable and confident market by creating standardized contract models, terminology and procedures, as well as establishing an accreditation system and bundling projects in order to overcome high transaction costs related to small size of projects.

The above barriers and drivers are explained (including details and examples) in the *Status Report 2007*, in which additional literature can be found. The present *Status Report 2010* looks at these and other barriers and success factors specific for every European country.

2. The European ESCO Market 2010

The present report builds on the national level because this approach was perceived to be most informative. It is essential to look at the European Union as a complex but open, thus permeable market. Policy and decision makers need to know the specific situation and specific problems and barriers of their respective countries, even though there are numerous multinational companies (MNC) that are present in the ESCO activities of more than one country. The overall assessment of the ESCO market on the EU level is a Herculean task outside the scope of the present work. It is not possible to obtain or estimate reliable data on the number of market players and the size of the entire ESCO market in the EU, mainly because the national markets are still rather individual. Therefore we set forth to provide an overview of the commonalities and shared problems that exist among countries, and to gain in-depth knowledge of diverse national markets instead. The present report also discusses issues of general importance to the extent that the national analyses allow.

The next section of the *Status Report 2010* introduces a detailed description and analysis of national ESCO markets. After setting the local context, the country overviews start with basic information on the national ESCO market where available, including the number and type of ESCOs, most important clients and preferred technologies and investment areas. The most common financing mechanism and contract types are investigated, too.

Furthermore, the crucial barriers and key success factors are presented, with an indication of what could be done in order to successfully overcome the obstacles and enhance the ESCO markets. Finally, present and expected trends of the ESCO industry are discussed. The key results and data are summarized in tabular format at the end of each country report. The country review follows alphabetically. The Member State reports are complemented by an assessment on European Union candidate countries and neighboring countries. The neighboring countries are divided among European countries that are not in the EU, the European part of the Commonwealth of Independent States (CIS Countries) and Non-EU South East Europe countries (Non-EU SEE).

2.1. The European Member States

Austria

Austria provides a successful example in the implementation of energy performance contracts and the development of an ESCO market.

The umbrella association for energy contracting (DECA⁶), which covers most of the energy performance market, reveals that its members have had a steady-state market volume of around €15 million annual investments in energy performance contracting projects in the last four years. The market potential in the non-residential sector is estimated at around €30 million in the public sector and €50 million in the private sector.

As of 2009, 5-14 local and multinational ESCOs are operating on the Austrian market. Most companies are utilities or building technology companies, where the ESCO division counts 10-15 persons. The typical company works in an area where the know-how and reputation in the core business can be used when offering energy

⁶ For further information visit: www.deca.at. A list of companies in the supply contracting market can be found under www.contracting-portal.at.

performance contracting. According to DECA, 3 market actors are building technology companies while 4 are part or subsidiary of a utility company.

Most companies offer EPC although energy supply, leasing, and operational contracts are also common. Guaranteed savings appears to be the preferred contractual model while shared savings contracts are used to a lower extent. EPC mainly target public buildings while supply contracting is more common in the residential sector and for public infrastructure (such as street-lighting). Supply contracting involves a range of project types, from small-scale biomass heat supply (mainly to the residential sector) to larger CHP generation and district heating supply. Project financing is done via banks loans to the ESCO or to the client, ESCOs' and clients' internal funds, and state funds.

There is a variety of policy instruments which support the energy services market, such as information and energy advice for private residential and non-residential buildings, public subsidies, negotiated agreements with the main utility associations, information and awareness programmes, and the Federal EPC programme for public buildings. "Mustersanierungsoffensive" is a campaign based on Klimafonds, especially directed to support best practice refurbishment in hotels and hospitality buildings. In non-residential buildings the federal subsidy "Umweltförderung im Inland" (UFI) can be combined with EPC. In the autumn of 2009, utility associations committed to achieve agreed saving targets. The companies represented by the association contribute to the achievement of these targets but do not have any formal obligation.

The Federal Contracting Initiative and support of the regional and national energy agencies are identified as the major market drivers followed by the higher energy prices and subsidies for energy efficiency measures in both residential and non-residential buildings. In the public sector, the Federal Contracting Initiative accounts for 30% of the annual EPC investments. The energy agencies are involved in marketing, providing advice on how to use the EPC approach (including information and advice activity for utilities), and acting as impartial advisors. Although the effect on energy performance contracting services is regarded as low, some indirect effect can be also attributed to the revised building code. Since the regulations are in force, more and more property developers seek advice in the planning of new office buildings. In all nine Austrian regions, the housing subsidies are tied to certain energy efficiency standards; in some regions, the subsidy is even tied to energy efficiency advice.

Municipalities and, most importantly, the federal state created a steady demand for EPC through energy performance contracting tenders for their own building stock and for street lighting. This has created a significant market push. Yet, so far, no "spin-off" effect to the private building sector can be observed. For the next years an increase in the supply of energy efficiency services is expected, including sectors which so far have only had limited activities in this field (such as private non-residential buildings like banks).

The following issues have been identified as barriers to the further development of the ESCO market: public procurement rules, international accounting standards (International Financial Reporting Standards (IFRS) for operational and financial leases), resistance from the client's technical department in outsourcing the service and mistrust from clients in the case of bad experience with energy consultants and

low energy prices. Unwillingness to enter into long contractual agreement is still seen as a barrier.

The case of Austria clearly shows the important role of energy agencies in taking a lead with pilot projects, creating demand, disseminating information and acting as an independent advisor. To improve the trust in the market, quality standards and certification (or labelling like in Austria's case) are very helpful in assuring quality.

Table 1. Summary of basic data of the Austrian ESCO Market

Number of ESCOs	5-14
Type of ESCOs	Private and public. Mainly Energy service & supply companies and consulting/engineering firms
ESCO Association	Association of EPC-Companies Austria (Dachverband Energie-Contracting Austria - DECA)
Size of the market	€10 - €15 M in energy savings out of €12 000 M in investment opportunities
Market development	Steady growth
Sector ESCO Projects & main EE measures	Supply side projects, complex building projects involving more energy services, and street or indoor lighting

Belgium

In Belgium, a stable growth was identified in 2008 in comparison to the period 2005-2007.

The Belgian market is composed by 6 large, 5-7 small and medium sized and 1 public ESCO (Fedesco⁷). The six large international companies (including Dalkia, Cofely (Axima), Cegelec, Siemens, Honeywell and Johnson Controls) offer EPC contracts with guaranteed savings and account for 70-80% of the market value. For most market actors energy service provision is predominantly supplementary to their main business activity. The providers are primary manufacturers of building automation & control systems with a smaller number of Facility management and operation companies, electrical service companies, and energy service and supply companies.

Complex building projects in the public sector such as HVAC and controls in hospitals and schools are the most common projects with a smaller number of cogeneration projects in the public sector (for example in hospitals).

The most common contract type remains BOOT, CEM and EPC with guaranteed savings, with a sharing of the additional savings.

10-15 projects are estimated to be running as of 2009 with a total value of several million € of which the public ESCO Fedesco has ESCO contracts worth about €3 million.

Projects are financed through TPF with banks lending to ESCOs, ESCOs' own equity, state funds (e.g. 100 million debt capacity with state guarantee) and partially

⁷ Fedesco is the Belgian Federal authorities' energy services company and third party investor. For further information visit: www.fedesco.be

with clients' internal funds. A limited number of projects are financed by clients' internal funds.

Fedesco and the national ESCO association Belesco have been active in the market development. Fedesco is organizing stakeholders and facilitating EPC in the public sector, for example by an initiative to retrofit federal public buildings, partially using EPC

Public financial incentives (regional subsidies, federal tax reductions) for energy efficiency and renewable identified have been supportive to ESCO projects. Green Certificates have been important in the market for PV Solar Contracting, Cogeneration, Biomass and other renewable energy sources. Public and private initiatives to develop the ESCO market together with clients need to reduce costs due to expected rise in energy prices are driving the market with innovative services (EPC Light, strategic/financial consulting, delegated project management, etc). Innovative technology developments by Belgian companies (e.g. high performance energy saving window film) are increasing efficiency of ESCO projects. Media actors (such as EnergyMag and EnergyForum) are also spreading the interest in ESCO solutions.

The financial crisis has accelerated regional initiatives for regional public ESCOs. The state-owned Fedesco's debt capacity has been raised from €10 to 100 million as part of an economic re-launch program by the federal government. On the other hand, the financial crisis has made it more difficult for private ESCOs to borrow and has had some impact on specific promotional activities to stimulate market demand due to budget restrictions.

Mistrust from the clients and the public procurement rules (with the initial complexity of implementing EPC in line with public procurement rules) have been reported to be the most common barrier to ESCO projects. The small size of projects, the lack of general knowledge about EPC, the lack of public ESCOs at regional level, and existing maintenance contracts are also identified as hindering project development.

Regional authorities are starting to take initiatives to develop the market, but there is little coherence and coordination between the 3 regions and a strong lack of public funding for ESCO projects in the public sector.

In 2010, Fedesco created a competence centre for energy services and financing of energy efficiency and renewable energy and launched its first EPC-contract tenders. In collaboration with Agoria, Fedesco is also striving to promote a dedicated regulatory framework for ESCO projects.

Table 02. Summary of basic data of the Belgian ESCO Market

Number of ESCOs	1 public, 7 large, and 5-7 small
Size of the market	N/A
ESCO Association	BELESCO
Type of ESCOs	Larger international manufacturers of building automation & control systems
Market development	Stable growth
Sector ESCO projects & main EE measures	Public buildings, HVAC and control and cogeneration

Bulgaria

Bulgaria is one of the European economies where large potential for energy savings exists but little energy efficiency activity has been undertaken until recent years.

About 20 companies work as ESCOs as of 2009, where a lower number (around 5) actually declare themselves as ESCOs and offer guarantees on savings. In comparison, 12 ESCOs were present on the market in 2007 (of which 1-3 offered guarantees on savings) (EC DG JRC 2007). In 2009, with the exception of one larger national company, the providers are mainly small local companies. Only around 3 companies have energy services as their core business, while the others are equipment manufacturers and distributors, building manufactures and engineering consultants.

The public building sector attracts the majority of the projects involving more energy services (e.g. lighting and HVAC) and complex refurbishment, whereas a lower number of projects is implemented in the street lighting projects and private non-residential buildings. Only a few projects are carried out in the industrial sector.

EPC and other performance based contracts are used. Guaranteed savings, shared savings and CEM are offered. Fixed monthly instalments for the repayment of the contract are used too.

Projects are mainly financed with ESCOs' own funds, through financial institutions (commercial banks and the EBRD credit line to industry) and dedicated funds such as the Bulgarian ESCO fund (BEF)⁸ and the Bulgarian Energy Efficiency fund (BEEF).

To the knowledge of the authors, there is no estimation available about the size of the market today, but the biggest ESCO is reported to have ESCO projects with the value of €4 million whereas the remaining part of the market is estimated to have contracts reaching the market value of €2 million. Energy efficiency projects involving municipal buildings are perceived to have a large potential in Bulgaria. Energy audits in public buildings recommend energy efficiency investments reaching a value of over €100 million.

Since 2004, the Energy Efficiency Act (EEA)⁹ regulates the ESCO model in Bulgaria. The Energy Efficiency law (Ordinance RD-16-347 of 2.04.2009) set the conditions and procedures for determining the amount and payment of grants under contracts with guaranteed results, leading to energy savings in public buildings.

In Bulgaria, the combination of rising energy prices, high energy efficiency potential, limited capacity and experience in the implementation of energy efficiency measures and reduced financial resources (particularly in the municipal sector) has increased the interest in ESCO solutions. Governmental policy promoting ESCOs such as the new Energy Efficiency Law has created a better environment with increased security for the development of ESCO projects.

Opinions differ on the impact of the financial crisis on the Bulgarian ESCO market. In general, the higher interest rates have lowered the access to finance. Mistrust in the market is perceived as the most important barrier to ESCO projects. The small size of

⁸ Energetics and Energy Savings Fund SPV (EESF), a special purpose company to finance the energy services business of Enemona AD, a construction and engineering group

⁹ For further information: <http://www.mi.government.bg/eng/norm/rdocs/mdoc.html?id=190688>

projects with high transaction costs, appropriate forms of finance and public procurement rules are also hindering the current development.

Table 03. Summary of basic data of the Bulgarian ESCO Market

Number of ESCOs	20
Size of the market	EUR 6 million
ESCO association	No
Type of ESCOs	Building manufacturers
Market development	Slow growth
Sector ESCO Projects & main EE technologies	Public buildings involving lighting and HVAC and complex refurbishment projects

Cyprus

No ESCO projects have been implemented yet in Cyprus according to the knowledge of the authors. Still, some local engineering consultants, architects, electro-mechanics, and manufactures offer energy consultancy and energy services.

From 2010, architects, mechanical and electrical engineers who are members of the Cyprus technical association can apply to become energy auditors and offer energy performance contracts for residential buildings. The largest potentials for energy services are found in the private non residential sector and public buildings.

The price of electricity, public campaigns, and financial incentives has raised the interest in energy efficiency.

The strongest barriers for the development of an ESCO market are the lack of awareness of the ESCO concept, mistrustful and unstable clients, and the small size of projects and related high transaction costs. Furthermore, the financial crisis has lowered the priority of energy efficiency investments.

More dissemination of information about the importance of energy savings in combating climate change is needed. In order to encourage energy audits financial incentives could be offered. Tax benefits for energy efficiency investments would promote investments by reducing the payback time.

Table 04. Summary of basic data of the Cypriot ESCO Market

Number of ESCOs	0
Size of the market	N/A
ESCO Association	No
Type of ESCOs	N/A
Market development	N/A
Sector ESCO Projects & main EE measures	N/A

Czech Republic

In the Czech Republic the ESCO industry emerged in a very short period at the onset of the 21st century. The EPC concept was introduced in 1994-1995 thanks to a €3 million investment in improving energy efficiency of the public healthcare institutions (Zeman and Dašek 2005) and further spurred in 2001 with the obligation for large energy consumers to perform energy audits¹⁰ (Žídek 2005).

In 2009, 8 -10 companies offered EPC contracts. The EPC contractors composed by small local companies specialized in energy efficiency renovation and investments and subsidiaries of large multinational manufacturers of building automation & control systems and supply companies. In fact, interest from energy supply companies in offering EPC has been rising in the last years. EPC remains a side business for the aforementioned subsidiaries while a minority of the local companies providing services and products other than ESCO solution. In addition, several dozens of companies offer other types of energy service contracts, whereby savings are not guaranteed.

The targeted market for ESCO projects remains the public buildings sector, which is estimated to cover about 80% of the market value. Besides public buildings, industry accounts for 10% of market value involving mainly co-generation projects. Private non residential buildings and district heating account for 5% of market each. Projects in the public sector are mainly implemented with the guaranteed shared savings principles in schools, hospitals, social care facilities, administrative buildings. The energy efficiency measures implemented include mainly efficient HVAC system installation, improvement of energy performance of boiler houses or complete boiler house refurbishment. There are also projects for lighting and pipe insulation. Thanks to subsidies provided in the scope of OP Environment (Priority axis 3) (see below), the popularity of investments in thermal insulation and windows exchange of public buildings has increased¹¹. EPC has been taken into account in several projects involving thermal insulation and for refurbishment of the technical equipment of the respective buildings (Sochor 2009).

A template contract has been developed for EPC, which is used in most public tenders and is based on a financial guarantee of savings, where the financing is provided by the ESCO. This can be adopted for cases where the excess savings (the savings over guaranteed amount) are split between client and ESCO. BOOT contract scheme is also applied, primarily in projects involving co-generation and renewable energy projects.

80% of projects are financed through TPF with local commercial banks lending to ESCOs. The remaining 20% of the projects are financed by ESCOs' own corporate funding.

The size of the ESCO market is reported to be around €2-4 million/year.

Consultancies often help customers in organizing public tenders for EPC and an informal working group has been established with the purpose of exchanging experience and designing activities to tackle barriers in order to cultivate the EPC market. The working group reviews project implementation rules, prepares standard

¹⁰ Act No. 406/2000 coll., on Energy Management

¹¹ The OP Environment grants encourage ongoing renovations to integrate proper control systems installations and boiler houses modernisation.

contracts, and follows the tendering procedures. Efforts are currently being made to establish an ESCO association.

Recent favourable changes in the national support framework available for ESCOs include the Operational Programme Environment¹² (OP Environment) and the State Environmental Fund (SFŽP)¹³. Between 2007 and 2013, this programme will offer €5 billion from the Cohesion Fund and the European Regional Development Fund and €300 from the State Environmental Fund of the Czech Republic and the state budget.

Priority Axis 3 dedicated to the sustainable use of energy sources (renewable energy production and energy savings) amounts to 14% of the total OP Environment budget. Grants can represent as much as 85%¹⁴ of a project's total eligible expenses (OPE 2010).

In the private sector, for residential houses SFŽP launched the Green Light to Savings programme in the spring of 2009. With the stated programme, it will be possible to obtain a financial contribution for thermal insulation of buildings, energy assessments and project documentation (Zahradník 2009). Eco-Energy¹⁵ is a financial support programme under the OP Enterprise and Innovation for business actors.

The availability of European structural funds increases the access to finance. The reliance on the grants, however, is claimed to cause delays to project implementation.

The ESCO market is perceived to have grown in 2008 in comparison to 2005-2007. The main attributes for this growth are marketing activities¹⁶ of local ESCOs and EPC consultants, increased energy prices and budget restriction in the public sector. High operational costs, obsolete energy infrastructure, lack of experience in how to improve energy efficiency (and achieve energy cost reductions), lack of internal financing and increasing freedom of building and facility managers in renovation and construction decisions has also increased the interest in EPC.

Although financing has not been a significant obstacle for ESCO projects, the financial crisis has re-opened the issue in the private sector (commercial and industrial) due to higher business and financial risks. On the other hand, as a result of the budget restriction, the financial crisis is perceived to have induced more projects in the public sector.

The main barrier to projects is the mistrust from clients towards ESCO projects, based on scepticism by management towards energy efficiency investments, complex solutions and energy performance contracting due to past unclear definitions and unsuccessful contracts. Although high potentials exist in the industrial sector, EPC is less popular due to the risk associated to unstable (and insolvent) customers. Also beyond the industrial sector, the unpredictable financial future of potential clients (private and to a lower extent public) which influences the providers availability to engage in long term contracts (over 6 years) reduce the activity in

¹² For further information visit: <http://en.opzp.cz/>

¹³ For further information visit: <http://www.sfzp.cz/en/>

¹⁴ For further information visit: <http://en.opzp.cz/sekce/509/priority-axis-3/>

¹⁵ For further information visit: <http://www.czechinvest.org/en/eco-energy1>

¹⁶ The ESCO's own lobbying activity was deemed particularly valuable in consolidating the market and awareness rising already in 2007 (EC DG JRC 2007).

sectors with important potentials, such as building retrofit involving insulation. Similar to other new member states, the absence of detailed, reliable information on present energy consumption and on the condition of the buildings complicates the definition of energy saving targets. Small size of projects and the related high transaction costs also remains a crucial obstacle, but, in the last years this issue has been reduced due to the bundling of smaller projects into a package. Nevertheless, criticism is also raised on the lack of appropriate rules for EPC projects implementation in the public sector.

The ESCO market has seen a continuing growth in the period 2007-2009 thanks to state support and marketing efforts by ESCOs to promote the ESCO market. The market potential for EPC projects (excluding residential projects and projects with payback time exceeding 10 years) is estimated at about €20 million annually. About 1/3 of this potential lies in the public sector (including schools, healthcare, administration, etc). Governmental support through guarantees of potential clients in the public sector would boost project implementation in the private sector by reducing the risk of insolvency.

Table 05. Summary of basic data of the Czech ESCO Market

Number of ESCOs	8-10
Size of the market	€2-4 Million
ESCO Association	Informal working group with efforts to create an ESCO association.
Type of ESCOs	Manufacturers of building automation & control systems and energy services and supply companies
Market development	Stable
Sector ESCO Projects	Public buildings involving HVAC-control system installation, boiler houses, lighting and pipes insulation.

Denmark

Denmark has achieved a strong growth of ESCO activity in the recent years moving from having hardly any ESCO activity in 2005 (EC DG JRC 2005) to 4-5 ESCOs in 2007 (EC DG JRC 2007) and around 10 small ESCOs (up to 50 employees) in 2010. Two of the most active providers are subsidiaries of international manufacturers of building automation & control systems and facility management companies. Other actors are specialized on ventilation, manufacturers of building automation & control systems and engineering consultancies with experience in the area of utility, construction and energy services.

In recent years the market for ESCO projects has re-focussed: until 2000, most projects were concentrated in the private sector (industrial sites), while since 2006 the public building sector has been gaining importance for ESCOs (EC DG JRC 2007). In the period 2007-2008 a number of municipal projects took off the ground. In 2009, most ESCO projects were developed in the public real estate sector. The building refurbishment projects mainly involve public buildings belonging primary to the local and regional administration with a growing interest from hospitals, schools, universities and public housing, where large saving potentials exist. A smaller amount

of projects are still developed in co-generation, street lighting and private residential and non residential buildings.

EPC with guaranteed savings is the most common contract type. Two of the most active ESCO providers, Danfoss Solutions and TAC (Schneider Electric), active respectively in industrial projects and in the municipal sector, both offer guaranteed savings in EPC contracts with and without financial solutions (DI Energibranchen 2008). Smaller companies collaborate by forming consortiums for tenders with one contract holder. As in other Scandinavian countries, third part financing is uncommon for this type of projects. Municipalities use state funds and industrial clients fund themselves with credit lines through banks or internal funds.

The total value of ESCO energy saving projects in 2009 is estimated to €8-25 Million.

Collaboration projects between research institutes, industry associations and the Danish Energy Agency (DEA) and the Danish Enterprise and Construction Authority are now running to promote the ESCO concept. These projects aim at explaining the ESCO concept, its benefit for different actors and the EPC process with the development of EPC models and an ESCO network. Dansk Standard, the Danish standardisation institute is currently working on a European standardisation model for ESCO projects covering measurements and validation methods (CEN/CLC SFEM, CEN/CLC TF189 Energy Management and related services and CEN/CLC TF190 Energy Efficiency and Saving Calculations) (Dansk Standard 2010). Seminars have been organized and information dissemination to raise the awareness of Energy performance contracting in association with cost savings and climate awareness.

The market grew faster in 2008 and 2009 than during the 2005-2007 period. The financial crisis is perceived to have lowered investments in the private sector while a budget raise given to the municipalities has raised the finance available for ESCO projects.

The main driving factors for the growth of ESCO projects have been climate awareness, CO₂ quotas¹⁷ and cost savings. The cost savings and opportunity to finance the replacement of old infrastructure with the energy savings and the opportunity to improve the green image internally and externally are a strong motivation both in the private and public sectors.

EPC is stated to be still a new and unproven concept where both clients and providers need to gain experience and trust in the concept. In 2009, although the financial issues remained (especially for projects carried out in the private sector) and problems with awareness and standardisation issues were present, their relevance as a barrier had diminished in comparison to 2005 and 2007 when financing issues related to state regulations and to the understanding of the market perspectives of financial institutions were identified as market barriers (EC DG JRC 2005, EC DG JRC 2007). In 2009, the most common barrier to ESCO projects was the small size of projects and high transaction costs. Other reported barriers remain the mistrust from the clients and the contracting with unstable customers for private apartment houses with shifting tenants.

¹⁷ European Union Emission Trading System (EU ETS)

The estimates of the potential size of the ESCO market range from €65 million/year to €10 billion/year¹⁸.

There is still a strong reluctance to outsource and the utilization of EPC is very limited among energy suppliers, construction companies and consultancies, industrial energy consumers and technology providers.

Factors which contributed to the market growth in 2007-2009 include improved awareness and confidence in the ESCO concept, along with traditionally strong regulatory focus on energy efficiency and energy savings. Most recently, the promotion of EPC in the public sector fuels the expectations for a continued and strong market growth.

Further financial and regulatory instruments are needed in order to enhance the benefits of using the ESCO concept such as: higher taxes on energy, financial subsidies for energy efficiency investments, adjustment of the political and regulatory process in the state and municipalities to support the utilisation of EPC.

Table 06. Summary of basic data of the Danish ESCO Market

Number of ESCOs	10
Type of ESCOs	International small sized manufacturers of building automation & control systems and facility & operation companies
ESCO Association	ESCO network – under the Federation of the Danish Industry / Energy Branch
Size of the market	€8-25 Million
Market development	Strong growth
Sector ESCO Projects & main EE measures	Mainly modernization and refurbishment of public buildings and industrial projects

Estonia

Information about the Estonian ESCO market is scarce and as of 2009 the market has not yet taken off. No ESCO activity was registered in 2009 and there is no common understanding of the nature of Energy Efficiency Services and contracts (Labanca 2010).

Until 2006, only two companies offered ESCO-type contracts supplementary to their core business, and the market was limited to a few transactions with the public sector involving public lighting, control and automation systems (EC DG JRC 2007).

The high level of governmental support and the low interest rate loans available for households limit the market for ESCOs by removing the incentive to look for ESCO services that have a financing element. Municipalities use structural funds for energy system improvements while the industrial sector has internally the technical and financial capacity to implement energy efficiency measures (EC DG JRC 2007). Support is given to the local authorities for the refurbishment of the district heating systems and public buildings (Tepp 2010).

¹⁸ Estimating the potential size of the ESCO market as the total value of possible energy efficiency projects in the non-residential sector, with payback time up to 10 years.

Identified barriers for the establishment of ESCOs and long term contractual agreements include election cycle-based thinking and attitudes and changing regulatory framework (EC DG JRC 2007).

Table 07. Summary of basic data of the Estonian ESCO Market

Number of ESCOs	2 (2007)
Size of the market	N/A
ESCO Association	No
Type of ESCOs	N/A
Market development	N/A
Sector ESCO Projects & main EE measures	Public sector involving public lighting, control and automation systems (2007)

Finland

8 companies provide ESCO services as of 2009, where 4 are actively participating in the market and 4 are only occasionally undertaking ESCO projects. In 2007 there were 11 companies on the market, of which four were active market participants (EC DG JRC 2007). All ESCO business units identified are composed by up to 50 employees where two national and two subsidiaries of multinational corporations dominate the market. The ESCOs present in Finland are part of manufacturers of building automation & control systems, facility management and operation and control companies, and consulting/engineering firms.

Finland has many energy intensive industries such as paper and pulp production, chemical industry and metallurgic facilities. Most projects are developed in the industrial sector followed by complex building projects in the public sector. As a result of tightening budgets of local authorities, a growth has been noticed since 2009 in the number of municipalities contracting ESCOs.

The most common type of contract is EPC in which both guaranteed savings are used and shared savings. The typical sources of financing for ESCO projects are local commercial banks. Government subsidies are also often included as a source of financing. The total estimated value of the ESCO contracts per year is currently around €4 million.

The Finish government subsidises (depending on the specific project) 15-30% of the investments carried out by ESCOs. Work has also been done in dissemination and marketing to decrease the mistrust of clients and increase the knowledge of the ESCO services.

In line with Finland's National Energy and Climate strategy, the sectoral Energy Efficiency Agreements for 2008-2016 has been started. By subscribing, companies and communities commit to plan, implement and monitor energy efficiency measures. In compensation signatories can apply for subsidies to implement their action plans. The framework agreements especially important for the ESCO market are the Energy Efficiency Agreement in Industries¹⁹, the Municipal sector Agreement²⁰ and the

¹⁹ The Energy Efficiency Agreements on the Improvement of Energy Efficiency in Industries cover the energy intensive sector within emission trading (industry and energy production), medium-sized

Höylä III Energy Efficiency Agreement²¹. The Municipal sector agreement specifies the use of savings guarantees and/or funding procedures in the implementation of investments, as an operational target and measure of the municipality. Municipalities are encouraged to use ESCO services to implement investments in the procurement of energy efficient systems and appliances, which can be carried out regardless of the rest of the investment budget. Municipalities shall also ensure the removal of obstacles for the use of ESCO services in own administrative and decision making processes and that their personnel is competent to enter ESCO contracts. Municipalities are also invited to take into account the possibility of using ESCO services when the lack of funding prevents the implementation cost effective investments (Energy Efficiency Agreement between the Ministry of Trade and Industry and the Municipality 2008).

No big changes in the business volume have been noticed in ESCO market growth. The market in 2009 is reported to have stayed at the 2007 level.

The Energy Services Directive has been identified as a driver to "activate" the market. Other identified drivers are the increasing cost competition, the need to improve cash flows, CO₂ limits, the need for off-balance investments and the necessity to change lighting systems. Recommendations from the national Energy Efficiency Committee, the Energy Efficiency Agreements and the governmental subsidy to ESCOs are also identified as important drivers.

The financial downturn related to the investment budget has been identified as one of the most common barriers to ESCO projects, followed by mistrust from the clients, insufficient knowledge and the lack of sufficient competitiveness of current concepts to meet the customers' needs. The credit risk for clients (especially in some industrial branches) has also grown due to the financial crisis making it harder to get financing from financial institutions.

An explanation for the slow growth is that the learning effect on the customer side has compensated the negative pressure on the financial market. The potential size for the ESCO market in Finland can be roughly estimated to be around €20 million yearly. In order to increase the competitiveness in comparison to other solutions and meet customers' needs, the development of service concepts better suited to the local market is necessary.

energy users (industry and the private service sector) and energy services (electricity transmission, distribution and retail, and district heating and cooling). Within one year after joining the agreement the companies have an obligation to map their energy use and set overall objectives. Within two years' time the companies must identify the energy saving measures and per each site, set up energy saving targets and schedule the implementation of the measures. Carrying out detail energy analyses in all sites will take a couple of years in practise. During the following years the companies must implement measures to fulfil the obligation on continuous improvement.

²⁰ The Municipal Sector Agreement includes both the Energy Efficiency Agreement of large cities, municipalities and joint municipalities.

²¹ The Höylä III Energy Efficiency Agreement covers distribution of liquid heating and transport fuels, as well as oil-heated properties. The agreements for goods transport and logistics, and public transport are under the responsibility of the Ministry of Transport and Communication.

Table 08. Summary of basic data of the Finnish ESCO Market

Number of ESCOs	8
Type of ESCOs	Both national and international manufacturers of building automation & control systems, facility management and Operation & Control companies and consulting/engineering
ESCO Association	N/A
Size of the market	Four million €
Market development	More confidence from clients but no relevant changes in market volume
Sector ESCO Projects and main EE measures	Industry sector projects involving process or horizontal technologies and motor systems and public buildings

France

In France, the provision of outsourced energy services such as public lighting, gas and electricity distribution and district heating dates back into the 19th century. The French market cannot be fully associated with the ESCO definitions usually applied elsewhere in continental Europe. Originally energy services were based on the combined operation and maintenance contract of HVAC systems. This type of contract is typically defined as "chauffage" or "contract energy management (CEM)" and revolves around a commitment to provide an agreed comfort service (e.g. heat, ventilation, etc.), including operation, but without explicit focussing on energy efficiency investments and improvements. Comfort services are usually contracted at a discounted price and include the energy supply. The public sector remains the primary client for facility management contracts. In recent years, an increasing activity has been seen in the industrial and residential sectors while the public sector still remains the primary client for facility management contracts (Hansen et al. 2009).

A central commission for contracts defines the main types of heating operation for public contracts and the duration of heating and air conditioning contracts is legally regulated (MINEFI 2007)²². The contracts differ depending on the share of the investment assumed by the ESCO and the duration of the contract, which in turn depends on the value of the guaranteed energy savings. The typical contractual agreements are:

1. Supply of energy, without explicit incentives (CEM). This type of contract can also be offered with elements of shared savings (defined by the central commission for contracts²³) also known as a "fixed price service".
2. Control and routine maintenance of installations delivered with a full guarantee.
3. Major maintenance and renewal of equipment. The building owner pays a fixed annual fee depending on the age and condition of the installations in exchange for

²² Published by the Ministry of Energy and Industry, "Guide de rédaction des clauses techniques des marchés publics d'exploitation de chauffage avec ou sans gros entretien des matériels et avec obligation de résultat". Available at: www.minefe.gouv.fr/directions_services/daj/guide/gpem/exploitation_chauffage/exploitation_chauffage.htm

²³ Defined by the Schedules of General Technical Specifications in the Public Contracts Collection no. 2008

the operator replacing all or part of any defective equipment during the term of the contract. This type of contract may be difficult to apply in the public sector since it is being seen as borrowing.

4. New equipment funding and investment depreciation.

New types of contracts are now being used. One of these new contractual arrangements is where the providers act as consultants and are paid through the saving achieved. A second developing contractual arrangement is the Public-Private-Partnerships (PPP), with specific award procedure. PPPs allow performance targets to be introduced into the letter of tender such as the level of energy consumption. The public establishment involves a third party in the funding, design, production, conversion, operation or maintenance of public equipment, or with the funding and management of services (Hansen et al. 2009).

Fedene, the French environmental energy services association has more than 500 members. Fedene defines ESCOs as companies that design and implement energy efficiency measures guarantying the energy services (to a certain level), as well as companies involved in energy management in the residential, tertiary and industrial sectors. Fedene has identified more than 100 companies with these characteristics. Among these, 5-10 companies work with performance-based contracts. Supply contracting and CEM are most commonly used.

The French market is characterized by a strong concentration of large companies, subsidiaries of national and international companies, having energy services as their core business or as a supplementary business. The following eight companies are the active actors on the market, able to offer complex solutions:

- Dalkia and Cofely (Facility management and operation companies),
- Siemens, Honeywell, Schneider Electric and Johnson Controls (Building Controls and Equipment Manufactures) and
- EDF and GDF-Suez (Energy suppliers and utility companies).

New actors entering the market are big installers providing financing in addition to traditional HVAC services (Hansen et al. 2009).

The most common contract type used is CEM. PPP are used in the public sector. Contracts where the provider guarantees the energy savings and clients take the financial risk have been increasingly popular since 2008.

The existing buildings sector is the main target for energy efficiency improvement where the building area represents 44% of France final energy consumption (ADEME 2009b). In 2009 ESCO projects are carried out (in order of importance) mainly in the sectors of district heating and CHP, public buildings, private non-residential buildings, renewable energy sources and industry. At least 10 major complex building projects in the commercial sector involving more energy services were developed in 2007, with a lower share of new projects in 2008. The turnover of energy service contracts with guarantees is estimated at €4-5 billion in 2009. The industrial sector had 20-30% of the projects developed during 2007-2008 and another 20% was realized with co-generation and other supply side projects. Only a small share, 5 to 10% of the projects realized during 2007 – 2008, were in street or indoor lighting refurbishment.

Due to the strong financial position of the energy service providers, a large part of the project financing is covered by ESCO equity. As of 2009 due to the financial strength

of French ESCOs, 60% of the ESCO projects were financed by ESCOs themselves, 30% of the projects' utilized TPF, while 10% of the projects were paid for by the clients. A more recent trend observed is that while the reliance on ESCOs equity for project financing remains common, an increasing importance is being given to TPF and state funds. Specialized services, elaborating the concept of TPF, are also being used where finance institutions covers the performance risk related to guaranteed savings. Potentially due to the high reliance of ESCOs equity in financing projects, the financial crisis has not have any important overall impact on the market. Still, a slowdown in demand has been noticed in the private sector.

"Le Grenelle de l'environnement"²⁴ is an action plan developed through a discussion with business, local communities, unions, and associations organised by the French government. The action plan includes policy objectives, information campaigns and financial instruments (ADEME 2009). A number of policy objectives concerning the residential sector have been introduced, including reducing buildings consumption of existing buildings by 38% by 2020 in comparison to 2008²⁵, refurbishing 250 million m² of residential buildings by 2018 achieving a reduction of 40% of the energy consumption and 50% of the GHG emissions and limiting the primary energy consumption for new buildings to 50 kWh m²/year²⁶ (ADEME 2009).

Several financial, regulatory and information dissemination instruments have been established along with and besides Grenelle to promote energy efficiency investments. Grants and subsidies are available from the regional offices of ADEME and funding under the PPP schemes for state owned buildings with renting until 2047 and up to 50 M€ /year available for thermal auditing. *ADEME Eco Prêt à taux zero* (National 0% Eco-loan) is a soft loans scheme for investments in thermal insulation with zero interest loans, co-financed by local authorities (regional councils) and banks for the residents in the regions "centre", "Picardie" and "Nord Pas de Calais" (ADEME 2009) The programme amounts to 2,5 Billion € and finances up to 30 000€ / project for a maximum duration of 10 years (up to 15 years for particular cases). The state compensates the costs of participating banks (transaction costs plus loss of interest) through a tax credit (ADEME 2009). The Regional Climate Investment Funds (Nord-Pas de Calais and Picardie regions) support projects of ESCOs, small and medium enterprises (SMEs) and local authorities through the creation of companies dedicated to energy efficiency. The Funds are used in quasi-capital or equity participation schemes at beneficial conditions for project managers, thus facilitating the debt pay off (ADEME 2009).

FOGIME (Fonds de Garantie des Investissements de Maîtrise de l'Energie) is a Crediting Guarantee Fund for investments in sustainable energy and renewable energy sources in the private sector. The crediting system is cooperation between ADEME and the French development bank (DG EC JRC 2007, ADEME 2009). FIDEME (Fonds d'Intervention pour l'Environnement et la Maîtrise de l'Energie) is an investment fund to support private investors in environmental and energy efficiency investments. FIDEME has a total budget of €45 Million and can provide up to 25% of total project costs (Naxis 2002).

²⁴ For more information please visit: <http://www.legrenelle-environnement.fr/>

²⁵ The level of building consumption per sqm/year in 2008 equals to 240 kWh which should be reduced to 150 kWh/sqm/year in 2020.

²⁶ In comparison to 100 kWh /sqm/year in 2005

In addition, personal income tax credits can be used to partially reimburse the investment cost of energy efficiency equipments by reducing the payback time of the investment. The program had a total budget amount of €1.9 billion in 2007 and was initially valid until December 2010 but then extended to 2012. In addition, it considers the works of insulation and energy performance diagnosis for the owner-lessor (budget: 700 M€) (ADEME 2009a; ADEME 2009b).

ADEME DPE includes building audits and certification for new buildings and buildings for sale with energy and CO₂ rating. ADEME EIE (Espaces Info-Energie), running since 2001, is a program to promote energy advisors supported by associations and/or local authorities committing themselves to give free information to general public about energy efficiency and renewable energy and to be independent towards energy suppliers and energy industry.

Despite the long list of programmes focused on energy efficiency measures, most of the funding is linked to the economic recovery plan and therefore linked to infrastructure works. The opinions on the real effects of the system of energy saving obligations and white certificates also differ; some market actors see them as having only a limited value so far on the market and therefore not fulfilling the function of a market instrument assuring access to financing the projects.

Several barriers still prevent the development of ESCO projects, including legislative restrictions for public procurement, low energy prices and split incentives in the rental residential sector (ADEME 2009) (Hansen 2009). Operation and in particular purchase of equipment in the public sector can only be assigned to private entities in the scope of very special and formal public-private-partnership (PPP) agreements.

The three major barriers to ESCO project development are (still) perceived as:

- mistrust from clients;
- limited knowledge and experience in and using EPC;
- public procurement rules.

The legally regulated contractual agreements for project development in the public sector are seen as a major hurdle for the introduction of the EPC. Public bodies are seen as fairly reluctant to look for innovative solutions in the scope of the public procurement code. Potentially, due to a lack in understanding in how energy savings are obtained, misunderstandings occur in the procurement of energy saving projects. Reluctance towards innovation risk is also blocking saving potentials. A lack of incentives is also felt for a wider spread in the private sector.

Nevertheless, the ESCO market is perceived to have been growing in 2008 in comparison to 2005-2007 due to a favourable policy framework (including incentives) and thanks to pilot projects, especially with retrofits of large universities and schools. A recent progress has been noticed in the public sector, especially thanks to the work of the National Energy Agency (ADEME) with the Grenelle programme, which has been able to create a market in the public sector with PPPs and private investments. Grenelle de l'environnement is one of the strongest driving factors for the market growth. Other programmes striving to increase energy efficiency such as the white certificates have had a lower impact on the market. There has been a start in the organisation of the industry in order to educate the customers has been notices together with a small increase in the number of the public bodies that do an EPC.

Further development of the ESCO market is expected with the new programme “Marché public” with the local Administration, where smaller amounts (< €5 million) will be accessible for project financing.

Table 09. Summary of basic data of the French ESCO Market

Number of ESCOs	10 big (100 smaller actors)
Size of the market	€4-5 billion
ESCO Association	La Fédération des Services Energie Environnement (FEDENE ²⁷), Association of Energy Efficiency Service Companies (CS2E)
Type of ESCOs	Facility management and operation companies, manufacturers of building automation & control systems
Market development	Growing market
Sector ESCO Projects & EE measures	District heating, CHP, Public buildings and private non residential buildings.

Germany

Germany is Europe's largest and most mature ESCO market. The development of the German market has been attributed to a good mix of governmental support (including both technical and financial support), non-governmental programs and favourable conditions such as the energy taxes (ecologic tax reform), which were increased considerably during the energy sector liberalisation along with an increase in energy prices. The implementation of a large number of municipal projects along with public-private partnerships also had a strong demonstration effect by introducing the ESCO and EPC concepts on the market. The successful implementation phase might also be attributed to the existence of a various number of competing energy service providers on the market, such as municipal utilities (Stadtwerke), manufacturers of building automation & control systems and independent players as energy agencies. Possibly due to the increasing usage of EPC and other contracting services, standard procedures, EPC model contracts, procurement procedures and contracting guidelines have been established, providing more confidence in the ESCO market place (EC DG JRC 2007).

In Germany, the predominant ESCO business model remains energy supply contracting (ESC). References will therefore be made to the general concept of ESCOs as companies offering energy services and to EPC as a “subgroup” of ESCOs.

In 2008, the total revenue of the Energy Service Market was estimated to be in the range of €1,7 billion up to €2,4 billion (BEI/Prognos/energetic solutions 2009), with more than 100.000 projects in comparison to 70.000 in 2007 (EC DG JRC 2007; Berliner Energieagentur 2009). The value of EPC projects accounts for a small part of the market, estimated to €250 million to €350 million /year. During 2007-2009, the ESCO market is perceived to have experienced a growth similar to the development in 2005-2007. The potential size of the ESCO market (energy efficiency projects in

²⁷ For more information please visit: <http://www.fedene.fr/>

the non-residential market with payback time up to 10 years) is estimated to be in the range of €7 - €12 billion.

The estimated number of ESCO providers range from 250 to 500 actors. Around 500 companies offer Energy Services while 250 to 280 companies are continuously working with Energy Services (BEI/Prognos/energetic solutions 2009), of which around 50 have more than one EPC reference (Berliner Energieagentur 2009; BEI/Prognos/energetic solutions 2009). Large national companies having ESCO as a supplementary business with a small dedicated unit are the principal actors of the market. Many SME with EPC as their main activity represent a smaller share of the market.

The market shares of different providers are approximately as follows (Berliner Energieagentur 2009, Prognos 2010):

- Energy suppliers, 66% market share (regional and association suppliers 17%, municipal energy suppliers 19% and other energy suppliers 30%),
- Building equipment and control manufactures, 26 % market share (heat appliance manufactures 14%, engineering consulting 8%, building and control manufactures 4%),
- Energy Agencies, 4% market share
- Other, 4% market share

Metering companies, providing metering and billing of energy consumption in the residential housing sector are also involved in ESCO projects.

The majority of projects running in 2007-2008 involved public and private commercial buildings. In 2009, the majority of projects involved public buildings (administration buildings, hospitals etc.) and to a lesser extent residential buildings²⁸ and industry. Even if small, the share of renewable energy and rental apartment projects is growing.

Most projects are carried out through CEM, where CEM is among others used as a supplementary service in Facility Management. Guaranteed savings, where the ESCOs guarantee the savings and the clients take the financial risk is predominantly used. Shared savings and guaranteed savings are thereafter most commonly used contractual types. BOOT contracts with and without guarantee elements are also less commonly used.

The source of financing depends on the project type. TPF is used with public contractors through non-recourse forfeiting of instalments from a public institution or factoring²⁹ while private contractors search off-balance solutions. All government's

²⁸ In Germany, the rental apartment sector alone (accounting for about 60% of all accommodations) with a annual heat demand of 218.8 TWh where according to a study supported by the Federal Ministry of Transportation, Building and Urban Development (BEI/Prognos/energetic solutions 2009), an annual amount of 25.5 TWh can be saved with projects which are "preferential" and "conditionally" suitability for EPC (depending on the energy source and the size and construction year of the building) (BEI/Prognos/energetic solutions 2009). The mentioned study reveals the impact of the energy efficiency measures in the renting apartment sector through EPC but conditioned to the dimensions of the accommodation units of the building (superior to 21 rental units) and the measures adopted where the modernization of heaters has a bigger potential in comparison to other potential saving measures.

²⁹ Similar to forfeiting, factoring is a form of cession of a bundle of receivables of goods and service deliveries with a short-term payment target and/or the cession of single invoices. Factoring mainly

funding is managed by the KfW, a non-profit banking group owned by the government (80%) and the Länder (20%). State funds, such as subsidies reduce the investment needs.

The recent financial crisis is reported to have had an impact on the financing of new projects. Project proponents face stricter conditions where bigger projects (requiring higher investments) and contracts of duration longer than 10 years have difficulties in finding funding. Problems have also been encountered on the capital market for “refinancing” which is important for the large part of projects using forfeiting.

The KfW raises funds from the financial markets and transfers this capital, via commercial banks, to program applicants in the form of lower interest loans. Since 2005 additional subsidies from federal government are used by the KfW both to improve the financial conditions of the programmes and to expand their volume. Thus, the KfW offers differentiated products, with regard both to financing products and to final recipients: loans (majority) and loans combined with a grant element of 5-17.5% of investment costs targeting a wide spectrum of applicants (enterprises, public bodies, individuals and collective households). The KfW Förderbank promotes housing construction and modernisation and energy conservation on the part of commercial enterprises and local communities. KfW funding programs target around 95% of existing buildings in Germany. KfW does not accord loans or any sort of financial product directly to the investor (some public applicants are exception), but to credit institutes. At present the following programs in the residential and public sector are ongoing:

- KfW Programme Housing Modernisation: existing residential buildings. The investor receives a long-term low-interest loan specifically targeted at EE with a fixed interest rate and repayment-free start-up years;
- KfW Programme Ecological Construction;
- KfW Municipal Loan Programme.

Within the framework of the KfW Build Ecologically Program long-term, low-interest loans for the building of new KfW 40 or 60 energy-saving houses, passive houses and installation of renewables-based heating technology in new buildings is provided. The KfW Housing Modernisation Program provides long-term, low-interest loans for various measures to modernise and improve housing. Especially low interest rates are granted for energy-related improvement work (eco-plus measures; thermal insulation and heating modernisation on basis of renewable energy). The KfW also has a Special Fund Energy Efficiency in SMEs; by the end of 2008 more than 558 sub-loans were disbursed, amounting to €315 million.

Increased demands in “green investments”, CO₂ emission reduction and optimisation projects in energy supply have increased the interest towards ESCO projects. The increasing cost pressure (partly due to the increasing energy prices), the need to save capital resources, personnel cutbacks, the increasing complexity due to higher regulatory requirements on energy generation has created a strong outsourcing trend, which has been identified as one of the strongest drivers for the ESCO market development. The refurbishment needs in the public is also identified as strong drivers. A couple of instruments have been identified as drivers to the ESCO market.

transfers the collection of payments and in the case of non recourse also of financial risks to a specialized FI. Factoring is not applicable for long-term contract durations.

Different policy tools used to stimulate the overall economy have been identified as facilitating the development of ESCO project such as the German grants for energy efficiency projects under the so called "Konjunkturprogramm", favourable credit costs for refurbishment investments from the state owned bank KfW and grants made available from the Federal Office of Economics and Export Controls (BAFA). The tax incentive system on the outsourcing of energy and electricity generation, the R22 (HCFC refrigerant gas) phase out programme, the use of Renewable Energy Sources for electricity generation, the co-generation program and the laws on energy savings are also identified as having a positive effect on the demand of ESCO services.

Yet, most survey respondents do not attribute the growing market to any particular program because programmes supporting investments in the residential and industrial sector are mainly directed toward new construction rather than existing infrastructure and energy efficiency.

The barriers identified in 2009 do not present any major shift of the market conditions in comparison to 2007. Long commitment periods, high transaction costs, budgeting and municipal regulations with public procurement rules are identified as the most common barriers to the development of ESCO projects. The main barrier for the development in the residential sector is the lack of a clear and definite legal position and (differently from the industrial sector) the resistance towards outsourcing propriety management and operations to third parties. A complexity in the performance of comparative cost analysis between different supply options has been highlighted. According to the present survey, the following factors have been identified as the most common barriers to the development of ESCO projects. The list of barrier is given in order of importance.

- Mistrust from the clients, connected to the complexity of the contractual process and the contractual agreement, scepticism and the perception of technical and business risk;
- The low awareness, lack of information and of qualified neutral advisors/consultancies (such as Energy agencies) for the project development
- Small size of projects and high transaction costs;
- The adversity of clients to commit themselves to long contractual agreements;
- Unstable customers (risk of default) due to the lack of resources and the lack of know-how in the procurement process;
- The public procurement rules only takes into consideration the purchase price;
- The tenant –owner dilemma.

In addition, the conservativeness of clients, preferring to invest in ownership (by buying the equipment instead of leasing and/or having the service supplied) and a lack of life cycle cost assessment and low importance of sustainability issues have been identified as market barriers. The complexity of the German energy market legislation and system, intensified by the local decisions and regulations is seen both as a hurdle and as a driver. From one side, it makes the development of independent developing projects more cumbersome. On the other side, the complexity increases the need to outsource the energy supply and leave the upgrading of the energy consumption to “experts”.

In 2009, some characteristics of the local support identified as a driving factor in 2007 are no longer present. The energy agencies do not develop projects on their own which previously was seen as having an important role as demonstration projects. Comprehensive and clear arrangements for contracting are necessary in order to achieve a further expansion in the residential apartment sector (BEI/Prognos/energetic solutions 2009). Life cycle costs of investments in energy generation, transmission and consumption should be considered in the public procurement process, giving EPC a favourable position in the bidding of refurbishment projects and making EPC a standard solution in the modernisation of energy systems in buildings. External consultants and mediators for project development are needed – a role previously assumed by energy agencies.

Table 10. Summary of basic data of the German ESCO Market

Number of ESCOs	250-500
Size of the market	1,7-2,4 billion €/a
ESCO Association	Energiecontracting, Vfw (Association for Heat Supply), ESCO Forum (ZVEI national association for electrical and electronics industry) and VDMA (national association for machinery and industrial equipment manufacturers, subgroup for Building Automation)
Type of ESCOs	Energy suppliers and manufacturers of building automation & control systems
Market development	Stable growth
Sector ESCO Projects & main EE measures	Public and private non residential building projects and Cogeneration, district heating and renewables through CEM

Greece

The ESCO market in Greece has been stalled for years due to the absence of EPC-related specifications in public tendering, tender evaluation, contract monitoring and repayment, and the vague definition of EPC and TPF actors (EC DG JRC 2005). A number of favourable legislative changes (such as a new law on Public-Private-Partnerships (PPP)) have in the last years enabled the creation of an ESCO market.

As of 2009 there are two local companies active in the Greek market. HELESCO S.A., founded in February 2008, is a small national engineering consulting company with its core business focused on the provision of energy services. It provides TPF for energy efficiency and renewable energy projects. COEFLY Hellas S.A. is a small national facility and energy management company (subsidiary of GDF SUEZ) providing facility management of installations and working with the ESCO concept as a side business. In addition, the project ST-ESCOS³⁰ promotes the creation and development of Solar Thermal Energy Service Companies (ST-ESCOs) by offering integrated energy services including the management of pilot solar thermal installations

³⁰ Supported by the Centre for Renewable Energy Sources (CRES) and Intelligent Energy Europe. For more information visit: <http://www.stescos.org/>

The energy service market is mainly focussed on the provision of energy services to the industrial and tertiary sectors. The provision of services to household and public sectors has not been developed. During 2008-2009 several projects were submitted to the "SAVE" programme ("EXIKONOMO") under the National Strategic Reference Framework (NSRF) and audits were carried out by the newly started HELESCO, although no ESCO projects were implemented. The majority of the energy audits and techno-economical feasibility studies carried out by HELESCO have been related to co-generation (including the production of biogas from the anaerobic digestion of wastes), waste heat recovery projects in the industrial sector, energy efficiency measures in private non-residential buildings, energy efficiency measures for public street lighting, and energy efficiency measures for public buildings.

The contract typically offered is an EPC with guaranteed savings whereby the provider assumes the entire design, installation and savings performance risks, but does not assume credit risk.

Sources for project financing include funds under NSRF, loans from local commercial banks (taken by the client with an ESCO performance guarantee of the energy savings) and ESCOs corporate funds. Helesco provides (off-balance) TPF for projects, preferably with less than 10 years payback time. Three Greek banks offer "green loans" with competitive interest rates (Piraeus Bank, Alpha Bank and EuroBank) for the procurement of energy efficient and renewable products.

With a budget of 100 million Euro, the national SAVE program ("EXIKONOMO") provides financing for energy saving activities in the municipalities. An additional program, "SAVES at HOME", is focused on residential buildings and is implemented under the umbrella of NSRF programme with a total budget of 400 million Euro. Both programmes are financed under the NSRF and focus correspondingly on public buildings, public areas and street lighting, as well as thermal envelope insulation of residential buildings, double glazing windows and old technology furnaces.

Public procurement rules have been one of the main barriers for ESCO projects in the public sector. Until recently, a public institution could not employ a private body to operate and manage the building energy services infrastructure of public establishments (EC DG 2007). With the Public-Private-Partnership law 3389/2005 the situation has been improved but still the existing legislation excludes the involvement of private ESCO in equipment purchase.

A new law ("Measures for the improvement of energy efficiency at end-use, energy services and other issues") implemented to harmonize the Greek law with Directive 2006/32 on energy end-use efficiency and energy services, entered into force on July 1st, 2010. The new law foresees, among others, that all energy providers will provide their clients with detailed information on their consumption. The energy providers are requested to offer energy services and energy audits and/or energy efficiency measures to their final end users at competitive prices.

Information dissemination activities about energy efficiency products, increased energy bills, environmental concerns, as well as political announcements about green economy can be seen as driving factors for the growth of the energy efficiency market. Clients are said to have already identified the need for energy efficiency actions on their premises. Despite recent improvements, the ESCO market requires additional dissemination activities through the promotion of structured mechanisms (legal and financial) for the providers to direct their services towards the energy efficiency market.

Discussions with market players showed that on the side of large institutions and banks there was interest for investing in energy efficiency projects and there were a number of projects in pipeline. The financial crisis has brought activities to a standstill.

The ESCO and TPF concepts are not widespread in the Hellenic market. There is an insufficient level of information and awareness about the ESCO concept and the concept is encountered by mistrust from the clients. The 2009 regulatory framework in Greece posed difficulties for the promotion of ESCOs in the local market. This was due to the vague framework for the establishment of ESCOs, as well as ambiguously defined rules and procedure for TPF. The absence of standardized financing models and monitoring of energy savings are reducing the access to finance and increasing the lack of trust in the market. Providers experience is that clients demand for energy service company services is strongly related to the availability of governmental subsidies.

In conjunction with the 3389/2005 law (Public-Private-Partnership), the new law (law "Measures for the improvement of energy efficiency at end-use, energy services and other issues", 01 July 2010) is expected to boost the ESCO's penetration in the Greek energy market. The main challenges and actions suggested by stakeholders in order to boost the ESCO market in the households and public sectors are:

- Awareness-raising of financial institutions and the general public regarding energy services. Awareness-raising of the general public can be achieved by promoting energy performance contracts in public buildings.
- The establishment of a national legal framework for the identification and the establishment of quality standards and certification schemes for ESCOs.
- Incentives provision in companies interested in entering the ESCO market, such as loans with favourable terms and subsidies.

Table 11. Summary of basic data of the Greek ESCO Market

Number of ESCOs	2
Size of the market	N/A
ESCO Association	No
Type of ESCOs	Energy Services and facility management companies
Market development	Market initiation
Sector ESCO Projects & main EE measures	Industrial and tertiary sector involving thermal solar heating

Hungary

Energy Service Companies sprouted in Hungary as early as the beginning of the 1990s at the time of political and social transition, starting with Hansen Associates providing EPC training funded by USAID. Hungary has been often referred to as a success story of ESCO markets. The fast dissemination of ESCO projects was aided by many and in particular the following circumstances:

- significant waste along the energy line as a legacy of the previous system;

- early energy market liberalization and the resulting increase in energy price;
- lack of financial resources of end-users;
- lack of professional expertise at the end-users (often due to the privatization and thus the disintegration of large public companies), matched with the local engineering expertise;
- willingness of financial institutions to invest in energy efficiency, and support from international financing institutions (IFIs) during incubation;
- strong willingness to open for new markets by engineering experts, SMEs, and producers and operators of installations.

In the ESCO Status Report 2007 (EC DG JRC 2007), we indicated that the Hungarian ESCO market saw fluctuations, which continue currently, sustained also by the financial crisis. There are around 20-30 companies in the ESCO registries consulted³¹. Numerous companies were forced out of the energy services business, while a few others got hold of new segments and extended their business offers or combined energy service provision with their existing portfolio. The current market value and the market potential have not been evaluated lately.

The 1990s saw 'cream-skimming' of easy projects with short payback time (3-5 years), mainly focused on public lighting upgrades, boiler house reconstruction, district heating system improvements, fuel switching projects, etc. The financing of these projects was based on ESCOs' own capital and the access to funds from international financing institutions (IFIs). International programmes were prioritizing ESCO activity in the municipal fora.

In the last decade, project developers have implemented a more diverse scope of projects, including projects with longer payback time (over 5-7 years or longer) (Rodics 2005), because the easier ones were slowly drying up. IFIs were backing out from the market, and 2008 saw the end of the long standing UNDP/GEF municipal programme, a sizable grant scheme for the support of energy audits in municipalities. Between 2001 and 2008, energy audits of about 1200 buildings were carried out under this programme. The changes in IFIs' attitudes were matched by the growing involvement of private financial institutions, because additional financing mechanisms were necessary due to the elongated payback time. The ratio of ESCO activity became approximately equal in the following three sectors: industry, district heating retrofits/development and the municipal buildings sector. In parallel, certain companies also started ESCO projects in "new" market segments, such as RES and CHP. Complex refurbishment of residential block houses also became a fast emerging market area mainly due to state and municipal grants available for panel blockhouse refurbishment.

Most of the ESCO clients still come from the municipal sector, while projects also take place in the residential (mainly block houses) and the industrial sectors. Typical projects are therefore related to lighting (street and indoor), boiler upgrades, modernization in industries, fuel switching, and district heating systems.

Both local and international ESCOs have been common in the Hungarian ESCO market, as well as daughter companies of energy suppliers. A few Hungarian ESCOs

³¹ One updated by the European Commission, JRC based on our contacts, one made available by the Energy Centre based on the UNDP/GEF Hungary Public Sector Energy Efficiency Project participants, and another one extracted from a report commissioned by the Energy Centre (Energy Centre 2009).

have been able to extend to other countries of the region. Modernization of lighting is favoured mainly by smaller companies, such as national SMEs. Daughter companies of energy suppliers are also interested in this field. Heating upgrades are typically larger projects that require significant investment, and have longer payback time; these projects have been mostly implemented by international companies. This area has seen some acquisitions, too. The projects are usually small-scale, such as simple investments in heating, and it is uncommon to engage in complex (heating, insulation, window renovation) projects. District heating system renovation is commonly done by big, multinational companies with stable capital background and are done primarily under chauffage contracts, i.e. long term energy service contracts with energy purchase. ESCO projects with CHP came into the spotlight with Resolution 56/2002 of the Ministry of Economy and Transport, which however comes to an end in 2010. The effect of the Resolution will dissipate only slowly because heating contracts were drawn for long periods (15-20 years). Finally the industrial ESCO activity is quite diverse, but it primarily involves long term heat provision and the operation of energy systems.

ESCO consortia exist, too. The "Szemunk Fenye Program"³² was started in 2006 where a Consortium including an ESCO, a financial institution, and engineering companies carry out lighting, heating and complex renovation in education buildings. Other consortia are based on the shared market by ESCOs and suppliers of installations and construction companies. These consortia are able to give a more favourable offer than what they could do separately. In addition, the ESCO can perform the quality assurance towards the customer.

Today, officially ESCOs are considered as key players for national energy saving targets according to the Hungarian National Energy Efficiency Action Plan. Close to 50% of the tertiary sector savings targets for 2016 is planned to be achieved through ESCO and/or third-party financing projects.

Table 12. Energy savings in 2016 in the tertiary sector according to the 1st NEEAP³³

Measure	Savings in 2016 (GWh)
Local municipality training, awareness building, consulting	250
KEOP 5.2 construction - Third-party financing	1 750
Encouragement of reduction of energy use in the Regional Operative Programs	125-175
Promotion of ESCO-type investment projects	125-625
Energy efficiency related to public procurement	1 250
	250
Total	3 750-4 300

³² Initiated by the Ministry of Education in order to increase energy efficiency and quality of lighting and heating in educational buildings. Further information is available at: <http://www.szemunk.fenye.hu/index.html>.

³³ Hungarian National Energy Efficiency Plan 2008

Increasing pressure on competitiveness and energy security translates into the need to promote energy efficiency improvements and to further decrease energy intensity of the Hungarian economy. This is combined with the policy pressure to implement the European *acquis communautaire*. In spite of the political commitment for the support of ESCOs and energy services, most of the implementing measures are still lagging behind. Indeed, one of the key barriers to the development of energy services is the fluctuation in energy efficiency policies, along with some policies with negative impact on energy efficiency, such as changes in the VAT system and cross-subsidies in energy prices, especially in the case of residential natural gas price.

Financing of ESCO projects comes from very diverse sources. Banks and credit institutions continue to play a significant role, although the financial crisis has made it more difficult to obtain loans. While the involvement of international financial institutions has decreased, there are still available financing programmes, such as from the EBRD. In the residential sector state grants for energy efficiency improvement have been important drivers for ESCO schemes. ESCOs have developed offers combined with the Panel Programme³⁴ and the National Energy Saving Programme³⁵. Residential ESCO projects rarely happen without the integration of state grants. State funding specifically for third-party financing and ESCOs was established in the Environment and Energy Operation Programme (EEOP) based on Structural Funds in 2007. This has been the result of lengthy lobbying by ESCOs and other energy efficiency market actors. In 2009 a total of 4 billion HUF (ca. €15 million) was made available for third-party financing for modernization of heat and/or electricity generation, for lighting and electrical system refurbishment, and for modernization of heat and/or electricity generation combined with renewable energy sources. In contrast, in 2007 and 2008 together 56 projects were financed in the value of 450 million HUF (ca. 1.7 million EUR). This was less than 20% of the total available funding. ESCO projects are provided with a lower grant than projects with only building owners.

A long discussion of the barriers of the Hungarian ESCO sector was provided in our previous Status Report, therefore only the few most relevant ones as of 2010 are discussed below. One of the major issues is still the lack of information among potential customers and trust in the ESCO offers. ESCOs search for their clients, even by promoting the ESCO solutions personally to the local governments. On the other hand, there are also clients (even residential ones), which look for the ESCOs because of the positive results in some projects. ESCOs have reported that they have difficulties with their contractors, and this can even jeopardize the success of the energy performance guarantees, as well as the reputation of the ESCO. The interviewed ESCOs believe that their role involves a strong quality check of the performance of the project, in order to be able to guarantee the savings.

Availability of financing was previously a major issue. While many sources were readily available for investments, ESCOs were not able to draw these credit lines,

³⁴ The Panel Program („Új Magyarország Lakás Felújítási Program” as it is called now) was launched in 2001, open for housing associations living in block houses. The grant is open for renovation projects and for modernization of heating systems. In the scope of the grant 1/3 of the investments is financed by the national budget, 1/3 is given by the municipality and the residents have to pay only 1/3 of the costs. The Panel Plus Program is a low-interest rate loan for helping residents pay for the 33% of the refurbishment costs.

³⁵ Support scheme for energy efficient renovation of residential buildings: doors and windows, heating systems, over-cladding, integration of RES

only the clients. This often created a problem of organization and confusion about responsibilities. With the introduction of the EEOP grants (see above) for both clients (municipalities, industries) and for ESCOs, this issue is expected to be resolved to some extent. However, it still bears two major perverse incentives. First, the ESCO application can achieve a lower grant level than client applications. While this reflects the for-profit nature of ESCO business, it discourages ESCOs from applying directly. On the other hand, there is a potential double financing of projects, as the same modernization programme is eligible under various grant lines, but with a different applicant.

Finally, the peculiarities of the procurement law have created a suboptimal ESCO monopoly in the municipal sector and make it extremely difficult for new entries. The municipalities do not have to carry out a local procurement process for energy services, but are allowed to consent to the winners of the central procurement. However, as a result, only one consortium seems to be employed in practically all municipal ESCO projects benefiting from EEOP grants.

According to some ESCOs, the financial crisis affected the market. The main impact was due to the stricter rules by banks on loans and the preference of financial institutions for less risky investments, and the solvency of clients. The problems in the construction industry also have had some impact on the market. This situation affected mainly smaller companies with some ESCO activities, which mostly diverted towards other, less risky businesses. There are ESCOs which overcame the challenge of the reduced construction level by offering integrated services, including operation and potentially the combination of energy efficiency and RES. The potential positive effect of the crisis to push towards energy saving was not reported by ESCOs.

There are recent regulatory changes due to the transposition of the recast of the EPBD that are expected to boost the ESCO market. This is expected to enlarge the demand for improved energy efficiency in buildings. Eligibility criteria for tenders for building renovation were adjusted to these requirements, too by the Government Resolution 2078/2008 (VI. 30.). Moreover, based on Government Decree 64/2009 (III. 31.), universal service providers have to publish on their website and make available to users free of charge the list and contact details of accredited certification bodies performing energy audits and providing energy services, and information on access to energy efficiency improvement measures and programmes.

Finally the following main recommendations were made by ESCO companies interviewed for a report commissioned by the Energy Centre (Energy Centre 2009):

- there is a strong interest for combined projects (energy efficiency and RES) implementation, thus these need to be included in the EEOP call and offered a higher rate of support;
- energy audits and energy certification need to be mandatory for projects supported by EEOP;
- procurement obligations need to be revised: under a certain project value it should be enough to invite 3 offers instead of having to organize a fully-fledged procurement procedure. Giving financial and expert support for the procurement process could also be an alternative solution, which could be combined with employing a specialized procurement expert company by the local governments;

- An accreditation criteria and procedure needs to be established and a list of accredited ESCOs created and circulated;
- ESCOs should be encouraged to take responsibility for operation, too (besides installation, reconstruction).

Some of these issues are already touched upon by the quoted legislative acts, but the result will depend on the implementation in practice. It is clear that the coverage of ESCO projects has broadened in the last years in Hungary. The financial crisis has had an impact on the market by eliminating companies not strongly engaged in this market, which were offering ESCO solutions as part of their portfolio. On the other hand, some companies have clearly strengthened, which raises the issue of market consolidation and market power. Some legislation and grant schemes have provided support for further strengthening ESCO business in already established areas, however less attractive fields (longer payback time, higher transaction costs) seem to be still avoided. Giving priority to complex projects and specifically ESCO projects would be desirable if the energy service market is to be engaged more. Actions should be taken to open up the market for new entries, while avoiding financing businesses that are profitable without state grants.

Table 13. Summary of basic data of the Hungarian ESCO Market

Number of ESCOs	20-30, but fluctuating and many companies do ESCO projects as part of many other activities
Size of the market	No current estimate available
ESCO Association	None
Type of ESCOs	Local SMEs, daughter companies of energy suppliers, multinational ESCOs
Market development	Fluctuation, quasi-monopoly in some areas
Sector ESCO Projects & main EE measures	Mainly in public sector, some in residential and CHP/renewables, lighting, heating, boilers, energy system operation, CHP, and block house renovation

Ireland

The Irish ESCO market development has not been subject to major changes since the completion of the 2007 European ESCO Update report. The terms EPC and ESCO are not widespread in Ireland, and instead ESCO-type work is referred to as Contract Energy Management (CEM), which is perceived as “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)” (DG EC JRC 2007).

As of 2009 15 companies are identified as energy service providers, of which 13 small enterprises have a market share of approximately 95 %. The majority of these companies are national companies. A few are subsidiaries of international companies and energy service provision is typically supplementary to other business activities. The providers are mainly consulting and engineering firms, energy service & supply companies and facility management companies.

The ESCO market is mainly focussed on co-generation and supply side projects in the service sector (e.g. hotels and leisure centres). A smaller part of the projects target district heating and renewable energies.

BOOT arrangements are the most commonly used contract type; these have no performance guarantees. Projects are financed by the ESCOs, client's funds and with public grants.

In 2008 approximately €4 million in state funding was dedicated to supporting ESCO projects. ESCOs have an important role in the delivery of the National Energy Efficiency Action Plan under Directive 32/2006/EC.

Market actors have reported that the impact of the financial crisis on the current market has been limited. Still, the Irish ESCO market is reported to have remained stable during 2008 in comparison to the period 2005-2007. Market drivers include the increasing electricity price and the relatively stable gas price which has increased the benefits of CHP³⁶. Taxation incentives and public grants have also given impetus to the market.

However, corporate clients tend to assign low added value to ESCO services. Clients' mistrust, lack of knowledge of the ESCO concept, low and fluctuating energy prices, small size of projects and related high transaction costs, as well as the long contractual terms often associated with ESCO projects are in the way for a further development of the ESCO market.

Table 14. Summary of basic data of the Irish ESCO Market

Number of ESCOs	15
Size of the market	Unknown
ESCO Association	No
Type of ESCOs	Consulting and engineering firms, energy service & supply companies and facility management companies
Market development	Stable
Sector ESCO Projects & main EE measures	BOOT CHP and supply side projects

Italy

The Italian ESCO market is a well developed one, with a relatively large number of companies.

There is no national registry of companies offering ESCO services, and the exact number of the currently operating real ESCOs is unknown, however a rough estimate based on the information from ESCO Associations and other registries suggests the existence of around 100-150 ESCOs. There are two major ESCO Associations: AGESI (incorporating around 30 large companies) and ASSOESCO (an association of 20 small and medium sized enterprises operating in cogeneration and electricity distribution in industrial and tertiary sectors). In addition, Federesco is an assembly of 35 local organizations dealing with various activities in the field of energy efficiency

³⁶ The decoupling of gas and electricity prices is mainly due to the use of coal in the power production, which incurs much higher penalties than gas in terms of the cost of carbon emitted.

interventions. There are small energy consulting agencies in the ESCO market, too. It is estimated that 30% of the ESCO market value is represented by 100 small sized ESCOs³⁷, 10% of the market is made up of 25 medium sized companies³⁸, and the market is dominated by the 9 large ESCOs. When looking at the number of ESCOs, 90% of the Italian companies are small enterprises³⁹. Of all companies, 80% have been active for less than four years. The major companies are typically subsidiaries of large multinational groups (most of them with French origin) and energy service provision is their core business. Lately some of these companies have been evolving towards the facility management services. The smaller ESCOs are often manufacturers of equipment.

Furthermore, Energy Services Enterprises (SSE) are also relevant in the ESCO market. SSE are companies that have successfully applied for the White Certificate scheme at AEEG, the Italian Regulatory Authority for Electricity and Gas. According to the 2008 AEEG annual report⁴⁰, of the 146 Energy Services Enterprises obtaining White Certificates, 44% declared to have ESCO activity as the main business profile. The number of SSE obtaining White Certificates grew to 196 in 2009⁴¹.

Obviously there is an overlap between the ESCOs registered at AEEG and at the ESCO Associations. The number of ESCOs that are able to provide long term performance contracts and have the technical and financial capacity to support the energy service project is estimated to be not more than 50.

The sectors targeted by ESCO projects of AGESI members are industry, residential and tertiary buildings, street lighting, co-generation, and renewable energy generation. ASSOESCO projects are developed in heating management services, lighting, electrical drives, cooling, co-generation and tri-generation and thermal recoveries. Another popular area is district heating.

The most commonly used contracts are Chauffage (mainly for heating/cooling management, also referred to in Italy as Heat Service Contracts), facility management contracts and other global services offers with some level of guaranteed savings. Energy Performance Contracts (EPC) – both with guaranteed and shared savings are reported to be used by some ESCOs. Yet, its diffusion is considered to be limited in Italy⁴². Often when EPC is applied, the customer has to bear some of the risks. AGESI members also use BOOT contracts. Heat Service Contracts, the so called “servizio energia”⁴³, are widely used in the public sector, particularly in public healthcare. This type of contract is a supply contract with an explicit forecast of energy savings in the contractual text, and provide for “qualified detention”, that is – similar to a BOOT contract - new plants remain under the ownership of the provider until the contract period, while the service fees are not tied

³⁷ up to 50 employees.

³⁸ between 50 to 250 employees.

³⁹ according to the 2008 FIRE Survey, available at: www.fire-italia.it and AGESI

⁴⁰ Rapporto annuale sul meccanismo dei titoli di efficienza energetica, December 2008. Available at: http://www.autorita.energia.it/pubblicazioni/altre_pubblicaz.htm.

⁴¹ Rapporto annuale sul meccanismo dei titoli di efficienza energetica, 23 December 2009. Available at: http://www.autorita.energia.it/allegati/pubblicazioni/eeRapporto_09.pdf. The growth of the number of SSE is probably due to the fact that as of January 2009, industrial enterprises with an energy manager and a minimum determined annual turnover became also eligible for White Certificates. The change has most probably not affected the number of ESCOs.

⁴² See for example ChangeBest project (<http://www.changebest.eu/index.php?lang=en>).

⁴³ “Servizio Energia” is described in article 1, paragraph 1, letter p), of the presidential decree DPR 26.08.1993, no. 412

to the energy savings achieved. The Heat Service Contracts are being substituted by Energy Service Plus contracts ("servizio energia plus"⁴⁴) which value energy savings more explicitly. The Energy Service Plus contract 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 "Certificazione Energetica" (building energy performance certificate)⁴⁵ and the installation, where possible of a temperature control system. Global Service contracts are also becoming widespread. While these do not ensure energy savings, they are preferred in the public sector because of the fixed service costs. Global Service Contracts are regulated by the 2000 Financial Law (art 30, paragraph 8 s9) where it is recalled as best suited to govern the provision of services, ensuring high levels of efficiency and management effectiveness.

Projects are financed by a wide variety of sources. AGESI members mostly finance projects with their own equity, with loans from local commercial banks, with client internal funds and by drawing state funds. Federesco indicates the use of bank borrowing, sometimes financing from ESCO's own equity or using the clients' internal funds. National guarantee funds are considered crucial. According to the results of the FIRE Survey⁴⁶, the typical sources of financing are: 28,45% own equity, 28,45% Third Part Financing, 24,40% shared funds, and 18,7% other type of project financing.

The Italian ESCO market size has been assessed by several sources. A business information company, DATABANK, assessed the market covered by ESCOs that are focused exclusively on energy efficiency services and whose revenue derives from the energy savings due to their activity. They found that the value of this market was €275 million in 2008 and about €387 million in 2009. An increase of 45.7% was reported from 2007 to 2008, and 15.7% between 2008 and 2009 (DATABANK 2009). The DATABANK analysis projects a market size of more than €520 million in 2010. Considering ESCOs whose core business is not centred exclusively on the provision of energy efficiency services, the estimated market size is €1.660 million in 2008 and €1.710 million in 2009 (DATABANK 2009). AGESI estimates a market value for energy efficiency projects of around €10-12 billion for existing residential and tertiary building (including hospitals).

FIRE reports that the banking sector seems to be starting to step up and engage in financing ESCO projects, and there are already some good examples⁴⁷. Banks introduce energy efficiency portfolios, promote financing tools and are ready to participate in ESCO projects. However, there is still a strong reluctance to use project financing below 10 million, thus requiring traditional assets as guarantees to cover the energy efficiency target in the contract. In addition, ESCOs have to cover the "off balance sheet" risk of the customer, if they engage in bank loans. The guarantee issue is particularly difficult for small ESCOs. Local banks are more disposed to participate in ESCO projects than large ones, and are prepared to collaborate e.g. in a consortium for the production of renewable energy⁴⁸.

⁴⁴ Decreto 115 Allegato II, Contratto servizio energia.

⁴⁵ Energy certification for buildings became obligatory with the issue of the legislative decree Dlg. 192/2005 (art. 6 paragraph 1-bis, letter c)).

⁴⁶ 2008 FIRE Survey, available at: www.fire-italia.it.

⁴⁷ FIRE Workshop "Investire nell'efficienza energetica", 19-20 November 2009, Sirmione, Italy.

⁴⁸ As example see CARI Prato – CONSER (www.conseronline.it)

Energy Service Providers prefer to work on large projects, thereby a large energy saving potential is left untapped in sectors with smaller-scale projects, such as small and medium companies, or households. To overcome this restriction, the development of so called “mixed” ESCOs, or regional public-private partnerships is promoted. These “mixed” ESCOs work as consortia of various types of entities. In a “mixed” ESCO the public party is responsible for the aggregation of demand, for guaranteeing and implementing the energy saving measure(s), and for the compensation for the risk of financial losses. ESCOs become an instrument to aggregate finance. Typically local and regional commercial banks are ready to take part in such a consortium. As of 2009, there are several dozens of “mixed” ESCOs in Italy.⁴⁹

There have been several legislative changes in support of ESCOs. The Legislative Decree 115/2008⁵⁰ 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 contract⁵¹ introduced originally by Presidential Decree 412/93, and that are increasingly used by ESCOs. The Decree also introduces a guarantee fund for ESCOs in the value of €25 million, and foresees the review of the white certificates scheme. A standardization norm for ESCOs is also set up by the Decree.⁵²

The 2007 Budget Law⁵³ established a deduction of personal income tax of up to 55% of the energy efficiency intervention costs in residential buildings, including the cost of ESCO contracts. This advantage is extended until 31 December 2010⁵⁴. According to AGESI, the effectiveness of this incentive could be increased by restricting it to complex and/or integrated energy efficiency improvement solutions, rather than, for instance, for the replacement of single components such as windows.

The financial crisis has had a minor impact on the ESCO market. Some ESCOs report a slowdown of contract management and investments especially in case of long term agreements. Financing of projects has been more challenging due to liability issues and more rigorous terms for energy efficiency investment portfolios.

The key existing driving factors at macro level for the growth of the ESCO market in Italy are the commitment to European and national energy CO₂ emissions reduction objectives and the high energy prices. In the public sector ESCO projects are necessary due to the need to concentrate resources on core activities and therefore to outsource energy management. Green and white certificates are seen as mechanisms in support of ESCOs in certain areas.

Most crucial barriers for ESCO projects are the lack of appropriate forms of finance, difficult public procurement rules, small size of projects and therefore high transaction

⁴⁹ Examples include: ESCo Provinciale Tuscia S.p.A. (Lazio), E2sco (23 municipalities e 4 private partners, Lombardia), ESCo Primiero (Trentino), Publicogen s.p.a.(Toscana), ESCo Berica (18 municipalities of Provincia of Vicenza).

⁵⁰ Official Journal n. 154 of 3 July 2008. The Decree implements Directive 2006/32/EC on energy end-use and energy services.

⁵¹ Which assures energy efficiency improvements by at least 10% for new contracts and by at least 5% for renewed contracts within the first year.

⁵² Art. 16, “Qualification of energy services suppliers” has been implemented. The standard “Energy Management – Energy Services Companies (ESCO) – General Requirements and check list for the verification of requirements” (E0202A990) is now issued as UNI CEI 11339.

⁵³ Law n.296/2006, Official Journal n. 299 of 27 December 2006.

⁵⁴ Law n.244/2007. Official Journal n. 300 dated 28 December 2007

costs. Customer default due to long term EPC agreement has been also reported as a hindrance. Difficulties are caused by the complicated authorization procedures and complex regulations by various authorities, lack of proper legal definitions, and that EPC are often considered to be a leasing agreement. The Italian National Agency for New Technologies, Energy and Sustainable Economic Development (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile) (ENEA) has confirmed many of the above observations⁵⁵. The ChangeBest project has found furthermore that there is a normative/economic uncertainty linked to the modifications in energy tariffs and monetary incentives in place, which causes a risk to the future cash flows from the project. There is also a financial uncertainty associated with incentives such as white certificates, which are subject to market and policy volatility. Finally, there is a technological uncertainty in using new and innovative technologies.⁵⁶

The following potential incentives are seen as important by Italian ESCOs:

- a concrete, long-term state policy support program for projects that result in measurable energy savings;
- dissemination campaigns to end-users;
- cooperation among ESCO Associations and technical institutes, in order to work out simplification of the relevant authorization procedures, standards and laws;
- creation of an official ESCO registry with stringent and restrictive criteria in order to ensure the clients' trust in quality of ESCOs and their offers;
- restatement of the 10% VAT for the Energy Service Performance

The Revolving fund for project financing made through an ESCO foreseen by Legislative Decree 115/08 (Art. 9) is considered to be too small. Furthermore, ESCOs propose that funding for efficiency measures could be linked to insurance policies covering the cash flows of ESCOs in order to decrease the costs of financing.

So far Italian energy service providers have shown preference to large projects due to their profitability; significant energy saving potentials still exist in residential and commercial buildings.

The primary advantage of the establishment of a public-private ESCO for public bodies is to activate energy efficiency improvement in buildings owned by the government, reducing transaction costs and unlocking significant saving potentials. However, Decree 223/2006 and Decree 112/2008 by the Italian state regarding the mixed Enterprises operating with government agencies introduced difficult constraints to ESCOs activities⁵⁷. Improvement of the energy performance of public buildings is not only about reduction of energy costs, but is also a tangible and visible form of public excellence and a way of information dissemination to citizens. Such projects provide an opportunity to exemplify the results and feasibility of energy efficiency interventions.

⁵⁵ ENEA and Ministry of Economic Development. 2009. Report RdS/2009/56 "Le Energy Service Company come strumento per la diffusione dell'efficienza energetica".

⁵⁶ ChangeBest project (<http://www.changebest.eu/index.php?lang=en>).

⁵⁷ Report RdS/2009/64 "Riconoscimento normativa sui vincoli legislativi alla costituzione di una ESCo mista"

Table 15. Summary of basic data of the Italian ESCO Market

Number of ESCOs	100-150 listed ESCOs, but only 50 with the technical and financial capacity to provide long term performance contracts
Type of ESCOs	Very diverse market. There are large companies, typically subsidiaries of international, but there are also small-medium sized ESCOs
Esco Associations	AGESI, ASSOESCO
Size of the market	€275 M in 2008; €387 M in 2009
Market development	Companies operating for a short time, growing trend
Sector ESCOs Projects & main EE measures	Buildings, lighting, renewable energy, cogeneration, industry

Latvia

The first ESCO activity started in December 2001 with the renovation of the street lighting system and the application of efficient lighting technology in one municipality (Rochas 2004). As of 2006, two companies were using EPC in Latvia (EC DG JRC 2007).

In 2009 there were 5 ESCOs - 1 international and 4 small national companies - present on the Latvian market and 50-60 Energy Service Provider Companies (ESPC). Energy service provision is the core business of two ESCOs, while the remaining three ESCO companies focus on equipment and energy supply.

The most common contracts offered are EPC with guaranteed or with shared savings. Projects are financed through loans from local commercial banks and subsidiaries of foreign commercial banks and state subsidies.

District heating, co-generation, street lighting and public buildings are the targeted sectors for ESCO projects. In 2007-2008 60% of the running projects were addressed at co-generation & other supply side investments while the remaining 40% involved energy services in the industrial sector. In 2009 projects were initiated in the private residential buildings sector too.

The value of the Latvian ESCO market is estimated at €1-1.5 million in 2009. The total value of possible energy efficiency projects with payback time up to 10 years in Latvia could be in the range of €100-110 million considering the potentials in the tertiary and the industrial sector.

The increase of energy prices from 2007 to mid 2008 and the availability of subsidies for energy efficiency investments in 2009 have increased the interest in the ESCO concept. No significant change has been experienced in the number of projects however, between the periods 2008-2009 and 2005-2007.

The most common barriers for ESCO projects remain mistrust from clients, the public procurement rules and unstable clients. The financial crisis has hampered the access to financing from banks, while it has also had an impact on the interest in energy efficiency measures and forced companies in the tertiary and industrial sectors to reduce their operating cost.

The ESCO concept lacks recognition by the central and local governments in Latvia. Implementation of existing European legislation is expected to boost ESCO businesses.

Table 16. Summary of basic data of the Latvian ESCO Market

Number of ESCOs	5
Size of the market	€1-1.5 million
ESCO Association	No
Type of ESCOs	Engineering consulting firms and energy services and supply companies
Market development	Strong
Sector ESCO Projects & main EE measures	Co-generation & other supply side projects industrial sector involving more energy services

Lithuania

A business plan for an Energy Service Company and the first ESCO businesses were set up in the framework of the SAVE project “Energy Service Companies in Lithuania” in 2001-2003. As of 2006, there were six ESCOs or ESCO-type companies (subsidiaries of large foreign companies) working in Lithuania. These were established mainly as subsidiaries of large foreign companies (EC DG JRC 2007).

In 2009 six small to medium-sized enterprises offering heat services in the public (non-residential) and residential buildings sectors were identified in Lithuania. ESCO-type projects are primarily developed in the district heating, co-generation and public buildings sector.

The main sector for ESCOs remains the leasing of district heating systems through CEM. Three of the aforementioned companies are part of international corporations. Guaranteed savings, shared savings or BOOT are the main contractual arrangements used. Commercial banks and the ESCOs' own corporate funding are the main sources of financing. Seven municipalities⁵⁸ have signed a district heat leasing contracts with Litekso (subsidiary of Dalkia) (Štreimikienė 2007).

The most common barrier to ESCO projects remains the lack of appropriate forms of finance. The consultancy company NEWHEAT⁵⁹ was established in 2001 through the no longer active Private Energy Market Fund (PEMF) to launch the ESCO concept in Lithuania, focusing on energy efficiency investments for the municipal energy utilities based on leasing financing.

⁵⁸ Marijampole, Vilkauskis, Kelme, Telšiai, Palanga, Alytus and Kazlų Rūda
⁵⁹ For further information: www.newheat.lt

Table 17. Summary of basic data of the Lithuanian ESCO Market

Number of ESCOs	6
Size of the market	N/A
ESCO association	No
Type of ESCOs	National and international facility management and Manufacturers of Building Automation & Control Systems
Market development	Slow growth
Sector ESCO Projects & main EE measures	District heating, co-generation, and public & residential buildings sectors

Luxemburg

Detailed information and recent information on the ESCO market in Luxembourg is scarce.

3-4 local ESCOs and daughter companies of large multinational companies of French and German origin were present on the domestic market in 2007 (EC DG JRC 2007).

In order to meet the Kyoto targets and other commitments a number of measures have been introduced and energy efficiency projects have been carried out such as voluntary schemes with industry, hospital associations and the banking sector, subsidies and fixed feed-in-tariffs for renewables, and support for households and the public sector to implement energy efficiency with a maximum subsidy of 40% of audits carried out for the buildings (MURE-Odyssee 2006)

Table 18. Summary of basic data of the ESCO Market in Luxembourg

Number of ESCOs	3-4 in 2007
Size of the market	N/A
ESCO Association	No
Type of ESCOs	N/A
Market development	N/A
Sector ESCO Projects & main EE measures	N/A

Malta

Specific information on the ESCO market in Malta is scarce. As of 2007 there were no ESCOs and the EPC concept was not applied. However, building management was offered by some providers and energy efficiency projects were carried out in governmental buildings and in the brewery sector. (EC DG JRC 2007). The introduction of relevant legislation, regulations and measures for energy efficiency was recommended by the European ESCO Status Report 2007 in order to promote the ESCO market.

Table 19. Summary of basic data of the Maltese ESCO Market

Number of ESCOs	0 (2007)
Size of the market	N/A
ESCO Association	No
Type of ESCOs	N/A
Market development	N/A
Sector ESCO Projects & main EE measures	N/A

Netherlands

Although the Netherlands has traditionally been among the leaders in energy efficiency policies, until 2005 there was hardly any ESCO activity on the Dutch market. Provisions for mandatory demand-side management requiring utilities to implement energy efficiency projects together with numerous projects implemented by the national energy agency left little space for commercial ESCOs in this period (EC DG 2005). Voluntary agreements, 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 supported by other means than ESCOs, including grants, and soft loans (EC DG JRC 2007).

A 2009 study by the Energy Research Centre of the Netherlands (ECN) shows that around 25 independent companies and 25 subsidiaries of larger organisations deliver energy services as their core business with a background in construction or engineering. Energy efficiency comes along with the general energy services provided and is part of operation and maintenance of installations for companies offering CEM contracts. The providers offer project management (design, build, finance) or service (operate, maintain) and a combination of renewable and energy efficient technologies. One ESCO has specialized on the transport sector, focusing on clean transport.

The largest customer groups of ESCOs in the Netherlands are in the commercial sector and public sector. Projects in the public sector are mainly developed in the public administration and health care sector. The projects mainly include the construction of new (large) non-residential buildings developed by focusing on an energy efficient architectural design and equipment. CHP, heat and cold storage, heat pumps, insulation, operation and maintenance are targeted in the public sector while renewables are also common for contracts with municipalities and the public administration. Energy saving technologies receive less attention mainly limited to efficient lighting projects developed in the public administration. Projects developed in the industrial sector focus mainly on supporting utilities, such as compressed air systems or installations in buildings or offices. Multifamily dwellings are less common clients. Insulation, energy efficiency of small installations, renewable energy (solar heating systems, solar panels, heat pumps) projects are nevertheless being developed in the private residential sector, mainly by new services provided by utilities.

EPC and CEM are the most common contractual agreements; outsourcing and lease are often used. EPC is mainly used with guaranteed savings, shared savings, and guaranteed savings with financial risk at the bank (financial lease). 40% of the ESCOs offer to assume the financial risk by financing the project or relating the repayment of the service to the savings achieved by using a performance contracts

Most projects are financed by a combination of sources depending on the demand of the client. Financing of energy efficiency projects can be done either by the provider itself or by the client and either using internal funds (shareholders' equity or other) or by issuing debt (third party financing).

The ESCO market is perceived as growing in 2008-2009 in comparison to 2005-2007. The total value of possible energy efficiency projects in the non residential sector with payback time up to 10 years is estimated at up to €9 million in the industry sector, up to €9 million in the transportation sector, and in the range €21-65 million in the service sector while the market potential in the household sector is evaluated in the range €12-62 million.

Several favourable legislative provisions and financial incentives, including performance standards for new buildings, subsidies available for private homeowners renovating their dwellings and fiscal mechanisms support the ESCO market. The liberalisation of the gas and electricity markets, higher electricity prices, raise in environmental awareness, and political support are driving the ESCO market. Energy saving measures have become more profitable for households and small companies due to the introduction of substantial energy taxes. The liberalisation of gas and electricity markets has transferred the semi-public energy sector into an independent and competing market oriented companies thus creating more room for ESCOs.

However, the knowledge of the ESCO concept and the services offered by ESCOs is still low and a low level of confidence is present in the market due to the absence of standardization and a specific legal framework for energy performance contracting. The complex definition of a baseline with external factors influencing the energy consumption hinders the establishment of contractual agreements particularly for contractual agreements including shared savings. The monitoring required by EPC is considered costly and time consuming. Providers find it difficult to offer acceptable levels of guaranteed savings due to changing behaviour of the energy customer and price increases. In general, a lack of awareness of energy saving potentials exists and energy efficiency investments remain in strong competition with core business related investments. Energy efficiency projects are perceived to have high technical and business risk. Interventions that could compromise the core business such as energy management in SME and auxiliary energy use in the commercial sector are met with scepticism. In specific industrial sectors ESCO projects are restricted to areas outside the core process. The financial and economic crisis has made the access to finance more difficult where the client cannot rely on the support of a larger mother company and/or lacks appropriate credit ratings.

The Dutch government has recently decided to apply 100% sustainable procurement, which implies also the renting of very energy efficient offices solely. This is expected to have a substantial effect on the overall demand for energy efficient offices, new and existing, and could be a driver to ESCO projects involving retrofitting and renovation. Furthermore, labelling of the energy performance of buildings increases the transparency of energy consumption and operational costs become visible for interested parties (future tenants or real estate investors). In addition, energy labels provide a tool for the monitoring of energy savings realised by ESCOs.

The Netherlands provides an example of how the ESCO concept can flourish within a few years with favourable market conditions and regulatory framework

Table 20. Summary of basic data of the Dutch ESCO Market

Number of ESCOs	50
Size of the market	N/A
ESCO Association	No
Type of ESCOs	Energy services, construction and engineering companies
Market development	Growing
Sector ESCO Projects & main EE measures	Middle and large non-residential new building projects addressing energy systems.

Poland

According to different estimates 3 to 10 multinational and local actors are present on the market, offering energy services mainly supplementary to their core business. Companies offering energy services as a side business are typically energy supply companies.

ESCO projects implemented in the public sector mainly concern co-generation, street lighting and district heating. Projects involving process and horizontal technologies in the industrial sector are also developed.

Projects are financed with a mix of commercial banks borrowing and client's internal funds, some subsidies. Forfeiting – or the sale of receivables - is also used as a source for project financing. Forfeiting is a form of transfer of future receivables from one party (cessionary – an ESCO) to another (buyer – a financial institution, FI). The original creditor (the ESCO) cedes his claims and the new creditor (the FI) gains the right to claim future receivables from the debtor (the client). The ESCO sells future receivables to an FI in return for a discounted one-time payment. A cession of future receivables is not a stand-alone financing option, but can serve as additional collateral for the FI. Only in limited cases is the ESCO providing its own equity for project financing.

The current value of ESCO projects is estimated at €5 - €10 million/year.

Poland's National Funds for Environmental Protection and Water Management in cooperation with Poland's Environmental Protection Bank offer investment support to energy saving projects at national, regional and municipal level. A number of other support schemes are also available, limiting the need for an ESCO for project implementation (EC DG JRC 2007).

As discussed already in the 2007 status report, clients are not willing to pay to outsource the risk of energy efficiency measure performance due to in-house expertise⁶⁰ in the municipal and industrial sites (EC DG JRC 2007). In addition, most Polish ESCOs do not have the capital base to finance projects themselves or through commercial banks.

The financial crisis has increased the cost of borrowing. On the other hand, financial restrictions are perceived to have increased SME companies' interest in ESCO solutions.

Energy prices and media campaigns have increased the interest in energy efficiency solutions. The amendments to the Law on Public-Private Partnership (with the introduction of a second act voted in the Parliament 2008) and the application of the

⁶⁰ Polish municipal and industrial sites have well-trained energy managers and thus already the in-house expertise to identify, evaluate and implement energy efficiency projects.

tradable White Certificates scheme (expected after 2010) are foreseen to support the future development of ESCOs.

By supporting the implementation of energy efficiency projects, public environmental funds lower the need for external financing for potential ESCO clients. Coupled with existing internal technical expertise, this provides little incentive for clients to work with ESCOs. Clients mistrust, lack of appropriate forms of finance and public procurement rules, along with a lack of experience in ESCO projects among public customers constitute the most common barriers for ESCO projects. The lack of recognition of the ESCO model in the Polish law reduces the confidence of potential customers. Tension is also seen in the market where electricity providers are perceived to hinder the realization of projects in the scope of street lighting. Financial institutions expect a very high security for opening credit lines and a lack of formal and financial support from the government and local authorities is felt.

Table 21. Summary of basic data of the Polish ESCO Market

Number of ESCOs	3-10
Size of the market	€3-10 million
ESCO Association	No
Type of ESCOs	Energy services and supply companies
Market development	No significant change
Sector ESCO Projects & main EE measures	Street and indoor lighting and co-generation in the public sector

Portugal

The markets for energy efficient technologies and renewable energy applications have been undergoing deep changes since 2008, supported by an important energy efficiency programme of the government.

In 2009, approximately 10-12 companies declare that they are ESCOs. Most of these companies are small and may be subsidiaries of larger national or multinational companies. Some of these small companies were founded as Public-Private Partnership agreements. The largest Portuguese utility, EDP, is also operating in the ESCO market. In most of the companies, energy services are core business. This is mainly true for local and national companies, but not so much in the case of large international companies. Currently, the market actors do not have an ESCO association.

ESCO projects are common in the industrial sector in which energy efficiency plans are mandatory when the annual energy consumption is higher than 500 toe. Moreover, the government is committed to sign an agreement with the power generation industry to reduce their energy consumption by at least 8% in the lifespan of the energy efficiency plan. In this sector cogeneration is the most frequent measure implemented. Hotels, offices and swimming pools are also commonly targeted by ESCOs in Portugal. Outdoor lighting is gaining importance. The use of RE technologies in ESCO projects is now in development with solar thermal frequently used, and the trend is to use solar photovoltaic applications in buildings and outdoor lighting.

Some companies are using EPC, though other types of non-performance based contracts are much more frequent. The Portuguese ESCOs market is predominantly

based on BOOT, mainly in the CHP sector, and Chauffage. Shared savings are slowly gaining popularity.

3 financing sources have been identified for financing projects at private company premises: own equity, local banks borrowing and, occasionally, customers covering a part of the financial resources needed. With regard to public projects, state funds may cover a part of the needs.

According to the energy services actors consulted, the current turnover of ESCOs in Portugal is in the range €10-30 million per year.

The National Energy Efficiency Action Plan (PPEC, Plano Nacional de Promoção de Eficiência no Consumo de energia eléctrica) of 2008 defines three horizontal action areas: behavior, taxes and incentives, and financing. A part of the public financing resources will come from the Energy Efficiency Fund, which is still to be established. They will be allocated to various specific areas: innovation, industry, Energy Service Companies (ESCO), Efficiency Cheque and Renewal+ Plan, efficiency credit, state energy audits, and communication and coordination. The economic and financial criteria to be used in this allocation will be a maximum payback time of eight years (simple payback), defined as the maximum acceptable period for return on the investments made in implementing the proposed measures.

PPEC allocated €9 million in 2008 and €16 million in 2009 for the support of ESCO activities. Another programme (Management System for Energy Intensive Industrial Consumers- DL nº 71/2008, 15 April) supports energy efficiency actions in general and imposes a minimum energy performance for certain industrial branches whose energy consumption is higher than 500 toe/year. In addition, it requires industries to perform energy audits and to present and implement Energy Consumption Rationalization Plans containing specific measures to reduce energy consumption (energy consumption higher than 500 toe/year).

Over the last 4-5 years, the Portuguese market has been growing steadily, though at a slow rate.

At present, the main driver for the growth in the ESCO market in Portugal is public procurement of new projects. Private companies nevertheless claim that current procurement rules do not facilitate long term agreement between ESCOs and public administration as the conditions stated in the call for tenders may be only based on price without energy savings criteria.

The financial crisis has had a negative impact on the access to financing for ESCOs. In addition, several potential clients have frozen some ESCO projects planned. The market at present is moving slowly because potential customers are more reluctant to sign long-term contracts.

Among the main barriers to market development, the most important is the lack of information due to the low number of projects implemented or best practices. There is no association of ESCOs professionals. This causes some problems such as lack of training or lobbying that delay the development of the sector. In addition, there are no proposals on how to best regulate the operation of companies. Due to the low number of ESCOs, potential clients are not familiar with this business. On the one hand there is a lack of information, the immediate effect of which is mistrust. On the other hand, those potential customers interested in receiving information are reluctant to sign long-term contracts even if the risk is partially assumed by others. Customers expect short payback and therefore a short contractual relationship with the ESCO.

Some best practices are needed to show customers the benefits of signing contract with ESCOs. In addition, the short payback requirements may be due to the current uncertain economical situation or to a lack of awareness towards the need to reduce energy consumption and the environmental, social and economical benefits of a sustainable attitude.

With the recent governmental commitments to support ESCOs, a strong boost in this sector is expected. Following the estimates from the surveys the potential is in the range €100-300 million per year. Considering the energy consumption share of the tertiary sector, large residential buildings and medium industry, the potential can be expected to exceed this estimate.

Table 22. Summary of basic data of the Portuguese ESCO Market

Number of ESCOs	10-12
Size of the Market	10-30 M€
ESCO association	No
Type of ESCOs	National companies and subsidies of international companies.
Market development	Slow growth. Thanks to the governmental energy efficiency strategy with support to ESCOs starting and credit line to finance energy efficiency projects
Sector ESCO projects & main EE measures	Buildings and outdoor lighting and industries involving cogeneration, micro-cogeneration, audits, lighting, energy recovery, motors and drives

Romania

Although Romania has seen decreasing energy consumption and a slight energy efficiency improvement over the last decades, it is still among the most energy intensive countries of the European Union.

In Romania there are now some 14 ESCOs, a good progress from our last survey done in 2007 (EC DG JRC). The great part of the Romanian ESCOs is formed by small companies (up to 50 employees) and only few medium and large companies. Romanian companies (Energy Serv being among the oldest ESCO in the market) are sharing the market with subsidiaries and joint ventures of international companies like Dalkia Romania, SE GES SA (company of the Romanian American Fund, with the support of EBRD), EnergoEco (joint-venture between the Canadian ESCO Econoler and the Romanian company EnergoBit) and ESA⁶¹.

The ESCOs are mainly involved in the industrial and co-generation sectors, but also in a few district heating and street-lighting projects. The most common types of contract used by the Romanian ESCOs are built-own-operate-transfer and shared savings. However, guarantee savings contracts, contract energy management and - very rarely - leasing contracts and delivery contracting are also used.

⁶¹ Danish Romanian company, with 51% from Danish Energy and Environmental Centre A/S, 46% from IØ Danish Investment and 3% from Romanian shareholders.

International agencies (EBRD, USAID, World Bank/GEF and UNDP/GEF) have also been active in the development of energy efficiency financing. FREE, the Romanian Energy Efficiency Fund⁶² was established by the World Bank and financed by the GEF and the Romanian Government to increase energy conservation activities and implement measures in the country.

In 2008, the EBRD launched its first credit facility to finance energy efficiency projects by private industrial companies in Romania. Under the new framework, the Bank will make loans to the banking sector which will then provide credits to private firms. Three loans have already been signed: €20 million to Banca Comerciala Romana (BCR), €10 million to CEC and €5 million to Banca Transilvania (BT). The loans are part of the EU/EBRD Energy Efficiency Facility, joint programme of the European Commission and EBRD foreseeing to provide up to €100 million in credits to banks involved in lending for energy efficiency projects in Bulgaria and Romania. The programme was complemented by €24 million from the EU Phare programme, which is to be used for technical assistance to support energy efficiency projects and for incentives to kick-start investments.

In Romania, the take off of the energy services companies was not slowed down by the lack of appropriate legislation for energy efficiency but by the lack of enforcement of secondary legislation. The energy efficiency law from 2000⁶³ foresaw the development of energy services companies, stipulating a 50% reduction of the corporate profit tax for a period of 5 years. The Law stipulates that all companies with energy consumption more than 1000toe/year and local authorities from communities with more than 20.000 inhabitants are obliged to designate an energy manager, to prepare an yearly energy balance and to prepare energy efficiency action plans, comprising short term no cost or low cost measures and long term measures for which investments and feasibility studies are needed. Also the companies with energy consumption of more than 200toe/year are obliged to undergo an energy audit by an independent authorised body and to prepare an energy balance every 2 years. However, these provisions have never been applied due to the lack of the secondary legislation.

In 2008 a Government Ordinance on energy efficiency⁶⁴ was published. This piece of legislation reinforces and completes the already existing law from 2000. For the very first time, ESCOs are mentioned among the target groups of the law. The ordinance provides definitions of ESCOs and EPC. In addition to the previous energy efficiency law, the ordinance introduces energy efficiency obligations for public property buildings. The ordinance has also introduced voluntary agreements, energy efficiency obligations for energy distribution companies, and the financial mechanisms. The Romanian Agency for Energy Conservation (ARCE)⁶⁵ was delegated by law to prepare qualification and accreditation systems for energy services providers.

The law for thermo-rehabilitation of existing buildings and stimulating the thermal energy savings was published in 2002, followed in 2003 by a law on special

⁶² www.free.org.ro; Fondul Roman Pentru Eficienta Energiei.

⁶³ The energy efficiency law 199/2000, modified by the Government order OG 78/2001 and by the law 120/2002, republished in 2002 in the Romanian Official Journal (Monitorul Oficial no. 734 from 8 October 2002).

⁶⁴ Government Ordinance no. 22 from 20 august 2008 published in Monitorul Oficial no. 628 din 29 august 2008.

⁶⁵ From 23 December 2009, according to the Law no. 329/2009, ARCE was dissolved, all the activities and duties being taken off by ANRE, The Romanian Energy Regulatory Authority.

measures for thermal rehabilitation of the multi-storey buildings⁶⁶. In 2005, a National Programme for thermal rehabilitation of the multi-storey buildings was launched. The Law stipulates that only 20% of the rehabilitation costs are covered by the beneficiaries (mainly association of owners), the rest being supported by the national and local budgets. In certain situations, the local authorities decided to cover also the beneficiaries share in order to foster the programme. After a slow start with only 100 buildings refurbished, in 2009 the programme was reinforced and several hundreds of buildings benefited up to date from this initiative. Public funds managed by the Ministry of Economy through some ARCE specific programmes could co-finance specific projects in public building rehabilitation, public lighting and district heating projects.

Despite the fact that the energy framework has improved significantly over the last 5 years, there are still some well known barriers for the ESCO development in Romania:

- Mistrust from the clients, also due to the lack of an official certification/registration system for ESCOs;
- The public procurement rules (the complex and time consuming tendering process) and the unclear status of the energy performance contracting. No specific provision in the public procurement legislation; the reimbursement of the energy services from the energy bill savings are not allowed in the public sector;
- Lack of pilot projects in the public sector contributed to preserve the reluctance of the local authorities;
- Lack of interest and internal expertise at commercial banks to evaluate energy efficiency projects. Projects run by private customers without the proper guarantee receive a low interest from investors.
- The poor understanding of the ESCO concept as well as the lack of 'the energy efficiency business culture' among the companies and local authorities.

There is a great potential for the ESCO business in all end-use sectors in Romania, but it is still difficult to work on this market due to legislative ambiguities and the above mentioned barriers. Several estimations indicate that the actual ESCO market is at around €50 millions with a growing potential at around €100 million.

Table 23. Summary of basic data of the Romanian ESCO Market

Number of ESCOs	14
Size of the market	Around 50 million Euros
ESCO Association	No
Type of ESCOs	Consulting and engineering companies, facility management and operation companies, energy service & supply companies, equipment suppliers and dealers
Market development	Strong growth
Sector ESCO Projects &	Mainly in industry (involving industrial processes and co-

⁶⁶ Law no. 211 from 16 May 2003. The thermal rehabilitation of the multi-storey residential buildings can contribute with significant savings taking into account there are some 83000 such buildings and all of them having a poor insulation.

main EE measures	generation) and less in public sector projects (few district heating and street-lighting measures)
------------------	--

Slovakia

ESCO-type companies appeared in Slovakia still in the 1990s. Yet, ESCOs active at the start of the 1990s did not perform very well, and 2003 could be considered as the real starting point (Murajda 2005). Similar to other countries with formerly planned economies, the lack of data to construct baselines, subsidized energy prices, and poor management/operation of buildings were common barriers in 2007 (EC DG JRC 2007).

In 2009, 5 small ESCOs-type enterprises were identified on the market. These companies are active as energy consultant companies, manufacturers of building automation & control systems, and energy service companies. National companies offer mainly energy audits, energy consultancy and part of energy contracting.

About half of the ESCO projects involve renewable energy sources, approximately 15% are developed respectively in each of the following areas: commercial sector, co-generation, and district heating. A small percentage (5%) of projects is carried out in street lighting. During 2007-2008 about 60% of the ESCO projects were complex buildings renovation and another 30% were co-generation and other supply-side projects.

CEM is offered for projects in the industrial sector; EPC is not frequently used. The main source of financing for ESCO projects is EU structural funds and customers own corporate funds.

The expected market value for energy efficiency projects in the non-residential sector is estimated to be around €10-20 million.

Due to existing state programs and as part of the economic recovery package, the financial crisis is said to have had no negative impact on the ESCO market in Slovakia. A program with a budget of €30-60 million for private building insulation and for changing to more energy efficient windows was created. The energy price is has also had a positive effect on the demand for energy efficiency investments.

Lack of appropriate forms of finance remains the most common barrier to ESCO projects. Mistrust from clients is the main reason for not establishing a contractual arrangement in about 10% of the cases. Energy efficiency funds are missing in Slovakia and no incentives for companies offering energy services are available.

Table 24. Summary of basic data of the Slovak ESCO Market

Number of ESCOs	5
Size of the market	€10-12 Million
ESCO Association	No
Type of ESCOs	Energy consultant companies, manufacturer of building automation & control systems, and energy service companies
Market development	Stable
Sector ESCO Projects &	Complex building projects and co-generation.

main EE measures	
------------------	--

Slovenia

In 2009, the ESCO market is composed by 2 – 5 small and local companies offering energy services as a side business. The number of ESCOs in 2009 represents a significant growth in comparison to 2007 when 1 - 2 companies were present on the market (EC DG JRC 2007).

The main focus of ESCOs is district heating, street and indoor lighting, and co-generation and other supply-side projects, while a lower number of projects are also developed in the industrial sector.

The ESCO providers use mainly EPC with guaranteed and shared savings, and offer the project financing by taking a loan from a local commercial bank.

Despite interest from foreign providers in entering the Slovenian market, motivation of SME to outsource energy management, the Slovenian ESCO market has not grown during the past years.

A recent decree setting limits on environmental pollution, building and lighting legislation, voluntary agreements linked to CO₂ tax exemptions, the availability of structural funds (2009 tender), as well as various financial incentives are expected to contribute to the ESCO market growth in the forthcoming years.

The 2008-2009 financial crisis had a negative impact on the market. The mistrust from clients, the lack of appropriate forms of finance, and the public procurement rules are identified as the most common barriers to project development.

Table 25. Summary of basic data of the Slovenian ESCO Market

Number of ESCOs	2-5
Size of the market	N/A
ESCO Association	No
Type of ESCOs	N/A
Market development	More actors but no significant change in the market
Sector ESCO Projects & main EE measures	District heating, street and indoor lighting, and co-generation and other supply-side projects

Spain

There is no official register of ESCOs in Spain. According to the survey conducted within the scope of this report among relevant companies, associations and public administration, the estimation is that around 15 companies are now operating in this field. The real number of ESCOs is probably higher.

The market appears to be mainly composed of large companies due to the fact that they are the only ones with sufficient financial capacity to assume the investment and returns in the long term. Yet, small companies are also playing an important role in this market though not as “real” ESCOs but rather as energy providers without the assumption of financial risks. Some foreign companies operate in the Spanish market competing with national ones. Foreign companies are experienced in energy services

and are now investing in Spain as a large emerging market with significant opportunities. Regarding national companies there is a mix of large utilities, construction and multi-services companies and small and medium companies. Most of them are oriented to the energy services sector as a way to diversify their activity. These companies are principally operating in cogeneration, street lighting, public buildings, private non-residential buildings and district heating.

In 2009, 2 associations bring together most of the ESCOs operating in Spain. AMI⁶⁷ (Asociación de Empresas de Mantenimiento Integral y Servicios Energéticos) is composed of 15 large companies. ANESE⁶⁸ (Asociación de empresas de servicios energéticos) has been established only recently and comprises more than 200 smaller associates.

Some regional energy agencies have been promoting energy services with renewable energies (solar thermal) by means of large programmes mainly targeting hospitals⁶⁹. In addition, some conventional fuels and biomass-based district heating have been developed and are now operating.

At present, EPCs are not common in Spain. The CEM (chauffage) along with shared savings are the most common contractual schemes. The Instituto para la Diversificación y Ahorro de la Energía⁷⁰ IDAE (National Energy Agency) published an EPC template with the aim to promote and facilitate procurement process by all Public Administrations.

Commercial banks have been the most common source of finance to ESCOs. Since the beginning of the economic crisis, lending conditions have tightened. Currently, several ESCOs are using their own equity to finance projects, which cannot be sustained on the long term. Some ESCOs have signed agreements with private funds to have access to credit. Different public financing institutions have financed projects for public building energy management.

According to the sources consulted in the framework of the present survey, the current market size is around €100 million but, as previously mentioned, this may be an underestimate. Private companies estimate the potential business for ESCOs would be in the range €1.4-4 billion.

Over the last ten years, the Spanish energy efficiency and renewable energy sources market has undergone important changes. On the one hand, through the Plan de Fomento de Energías Renovables 2000-2005 and 2005-2010⁷¹ (Renewable Energies Programmes), the electricity production from renewable energies has experienced a significant growth. In this framework wind energy generation production capacity has grown from 2.744 MW in 1999 to 27.509 in 2007. Solar energy generation capacity rocketed to 501 MW in 2007 from just 17 MW in 1999⁷². This programme, which is based in decreasing feed-in tariffs, is principally managed by the national government. In addition, specific measures such as the approval of the Código Técnico de la Edificación (National Building Code), which obliges new

⁶⁷ www.amiasociacion.es

⁶⁸ www.anese.es

⁶⁹ Ente Regional de Energía de Castilla y León EREN – HOSPISOL programme. Solar thermal energy production in 15 hospitals

⁷⁰ www.idae.es

⁷¹ A new Renewable Energy Programme covering the period 2011-2020 is in development

⁷² DG TREN – Statistical pocketbook 2010

http://ec.europa.eu/energy/publications/statistics/statistics_en.htm

and refurbished buildings to cover a certain part of their energy needs with RES, have sped up the growth of renewable energies in the building sector. The new regulation on renewable energies use and energy efficiency in new and refurbished buildings was approved in 2007, and stated to have a clear impact in 2008.

In addition, the Estrategia de Ahorro y Eficiencia Energética E4 (National Energy Efficiency strategy) was approved by the government in 2003 to implement measures in several sectors in the period 2004-2012. Currently the sub-programmes E4+, which cover the period 2008-2012 with a total public budget of 2.4 B€, are being implemented. This plan is a collection of demand side management measures in 6 sectors (buildings, industry, transport, agriculture, public services, and appliances). The E4 programme is managed by the government of the Comunidades Autónomas (regions) and to a large extent by the regional energy agencies. In particular, the E4 programme subsidizes 75% of energy audits costs. The solutions proposed in the energy audit report may be eligible to receive additional subsidies (less than 22%) for their implementation if they fulfill certain conditions.

No growth has been observed in the number of projects developed during 2009 mainly due to tightened lending conditions. Yet, the number of interested potential clients is growing and companies think this may be a good moment for working with ESCOs. The government has been promoting the E4 (Estrategia Eficiencia Energética España) strategy with a wide range of measures with a positive effect on the possibilities and interest of energy efficiency.

Energy agencies' promotion of ESCOs along with an increase in energy efficiency awareness has created a positive framework for the implementation of ESCO projects in Spain. In addition, the high oil prices of 2008 also had a positive effect for the development of the ESCOs market.

The main drivers that are now developing the market include positive regulation and political will, the need to reduce costs and the willingness to outsource facility management in public buildings.

The barriers identified in the Spanish market include:

- Lack of specific regulation addressed to ESCOs and customers. Every contract is specific for each situation and is negotiated by the parties. Even if there are subsidies for different areas of energy consumption, ESCOs cannot have access to these;
- No suitable financing schemes for the development of ESCOs and ESCO projects;
- Need for training of staff in the energy efficiency sector;
- Customers do not want to enter into long term contracts;
- There is a lack of best practices to show the potential benefits to customers;
- Clients are sometimes sceptical on leaving an external company operating in their properties;
- Payment delays from the Public Administrations.

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 to 20 years.

The government is now preparing calls for tenders to implement energy services in 330 public buildings (such as ministries, prisons, airports, and military bases) with the objective to reach a 20% energy consumption reduction in the buildings owned by the national government. The IDAE will support this project from a technical point of view and will also approve a grant programme of €4.2 million to support the preparation of proposals and €52.2 million to subsidize investments. The programme being set up by the government will be completed by the following measures:

- Preparation of a model ESCO contract;
- A credit line of €7.12 million to substitute coal and oil boilers by biomass ones;
- A specific training programme with the Escuela de Organización Industrial⁷³;
- 2 pilot projects in large buildings;
- 2 pilot projects in outdoor lighting.

A steep growth of ESCOs is expected reflecting the high opportunities associated with the Sustainable Economy Law, which is currently in preparation. One of the objectives of the law is to create a positive environment for the entrepreneurship in the ESCO sector. Art. 102 of the Law provide a definition of ESCO, which is very similar to the one in the Energy Service Directive (2006/32/EC). According to this definition, the company should assume a certain level of financial risk. The law states that the government will develop a specific plan aimed at promoting ESCOs, remove barriers, and facilitate financial resources. The law, which is expected to enter into force in 2010, will probably require a register of ESCOs companies. The plan will oblige the national government to set up a specific program to use energy services in public administrations.

Table 26. Summary of basic data of the Spanish ESCO Market

Number of ESCOs	> 15
Size of the Market	> 100 M€
ESCO association	AMI and ANESE
Type of ESCOs	National and international large utilities, construction and multi-services companies
Market development	Growth due to large Governmental Programme, specific law to regulate their implementation and promotion of ESCOs from energy agencies
Sector ESCO projects & main EE measures	Public Buildings, private non-residential buildings, and industries involving cogeneration, audits, HVAC control systems, lighting

Sweden

The ESCO business in Sweden experienced two upsurges, respectively in the 1980s and in the early 1990s. Yet, neither of these established the ESCO business concept on the market. Despite a disappointing start, the domestic EPC market has

⁷³ www.eoi.es – Business School

undergone a strong development during the last years (Gottberg et al. 2009). This recent development can mainly be attributed to projects in the public real estate sector.

The market consists of five to ten EPC providers with up to 70 employees in the relevant division. The market is served mainly by a small number of international companies offering EPC supplementary to their core business and smaller companies with energy service as their core business. The companies offering EPC arrangements are mainly manufacturers of building automation & control systems, facility management and operation companies and energy service and supply companies.

The public sector is the biggest ESCO customer. Projects are contracted for the refurbishment and modernization of public buildings involving more energy services (e.g. lighting and HVAC), complex refurbishments and fuel switch in oil-heated buildings. Industrial applications and refurbishment in private non residential buildings are attracting a lower number of projects.

Guaranteed savings and shared saving are the most commonly used contract types. A high importance is given to performance guarantees by reassuring the project owner and lowering the interest rate for the project financing (Forsberg et al. 2007). The main source of financing for ESCO projects remain client's internal funds and state funds. Third party financing is not common.

The size of the ESCO market, calculated as the total value of ESCO energy saving projects, is reported to be €60 to €80 Million a year, while the potential market size (excluding projects in the residential sector or with a payback time superior to ten years) is estimated to reach a yearly €100 to €150 Million.

To spur EPC projects, the Swedish Energy Agency (STEM) is pursuing a "portfolio of flexible mechanisms", including the formation of an ESCO network, customer oriented information, guidelines for the procurement process, model contracts, EU-IEE projects and project evaluations.

The majority of the projects are being developed within the public sector due to the long contract terms and governmental incentives available since 2000 (Forsberg et al. 2007). An increased priority of energy efficiency on the political agenda has set the scene for various drivers for energy efficiency improvements in buildings. Energy certificates for buildings, the subsidy scheme for public building owners (KLIMP⁷⁴), and a set of market instrument which lead to a rise of electricity prices (CO₂ taxes, green certificates, electricity tax for energy intensive companies (PFE), etc.) have been identified as important elements in the development of the EPC market by increasing the importance and profitability of energy efficiency measures (Lindgren Soroye and Nilsson, 2010; Forsberg et al., 2007). Beside the financial benefits from the energy savings, improved public image is also seen as a strong motive for the implementation of ESCO projects

Structural and market related changes, such as building refurbishment, modernization needs and the building owners growing preference to outsource

⁷⁴ The Climate Investment Programme KLIMP supports municipalities and other local actors to receive grants (up to 30% of the investment) for long-term investments that reduce greenhouse gas emissions. Together, the programmes comprise about 900 measures and an investment volume of just over SEK 8 billion) (Naturvardsverket 2010).

operation and maintenance services have also been of importance for the development of the market (Forsberg et al. 2007).

Despite the recent market progress, the ESCO market in Sweden is not very competitive (Gottberg et al., 2009). The market is segmented (especially in the public sector) with a restricted number of international and specialized actors each with its own niche. New market entrants or less established companies have greater possibilities in the private sector, where entrance barriers are lower and the market segmentation is less well-defined.

The 2008-2009 financial crisis is reported to have prolonged client's decision-making-process thus bringing fewer projects to the market. For most projects however, the main barrier is not lack of access to financing, but rather the perceived risk which increases the cost of financing (Forsberg et al. 2007). According to a report by STEM, the main barrier in Sweden remains the limited knowledge and experience of the energy performance contracting model which makes it difficult for customers to engage in this type of contractual model. The main reason for this inexperience is the lack of confidence created by the absence of credible and visible reference cases with a clear client focus (Forsberg et al., 2007).

Furthermore, the Swedish EPC market presents many of the barriers identified in most other European markets such as: limited knowledge and know-how in the public and private sector, legal issues and inappropriate accounting rules (Forsberg et al. , 2007), lack of standardization (Gottberg et al. 2009) and low energy prices increasing the long pay-back time of projects. Barriers common to other markets, but especially highlighted in Sweden are: lack of confidence, poor competition, collaboration and commitment issues, the Public Procurement Act, and aversion to innovative practices and a "cultural unacceptance" to making profit on an environmental concern.

The lack of confidence, specific to the Swedish market, is connected to the past unsuccessful experiences of ESCO projects (in the '80s and '90s) of not reaching the expected performance and revenues⁷⁵ (Gottberg et al. 2009; Forsberg et al. 2007). The niche segmentation and the low number of ESCOs can explain the low level of competition. A lack of skilled people with the right background has also been identified as a barrier for the growth of ESCOs. The restricted number of market participants increases the costs of the service (Gottberg et al. 2009). While the cooperation between competitors is perceived to be very good, the involvement of the customer is initially easily underestimated from their own part. The contractual model is considered expensive, leaving the client highly dependent on the provider and with low flexibility to changes in business, volumes, saving ambitions, etc. (Gottberg et al., 2009). The complex and time consuming application of The Procurement Act for the procurement of EPC services and the restrictions in the tendering process are raising the projects transaction costs. The public tendering regulations require experience in all relevant project specific sectors which hinder the entry of new and less established market actors. Representatives from public sector state that the Public Procurement Act may counteract the most energy efficient measures (Gottberg et al. 2009). The attitude "this is how we have always done it" remains present with a strong suspicion towards new models (Gottberg et al., 2009).

⁷⁵ The differences in expected performance and revenues partly resulted from a combination of falling energy prices, economic downturn and non standardized evaluations and validation measures.

In addition to the aforementioned skepticism, a particular cultural issue is the sensitive association of environmental concern and energy saving measures with monetary profits. It is difficult to present environmental issues and energy concerns as a business model. Clients dislike the idea of someone making money from their environmental concern and sacrifices (Lindgren Soroye and Nilsson, 2010; Gottberg et al., 2009).

Some lessons can be learned from the barriers and drivers influencing the domestic market development. The coordinated actions of a public authority disseminating information and advising potential project participants gives more legitimacy to the business model and to the EPC providers, thus building confidence on the market (Forsberg et al. 2007). Setting clear deadlines for the admission of public subsidies for energy efficiency improvements gives a push in accelerating the speed in initiating and applying energy efficiency measurements (Gottberg et al., 2009).

Some market adjustments to overcome the complex procurement rules are ongoing, with the positioning on the market of procurement consultants to assist customers in the public procurement process. In order to overcome the identified barriers and to reach a healthy and growing development of the ESCO market in Sweden the following comprehensive framework of improvements is suggested:

1. Legitimizing the ESCO business model in order to create confidence on the market by:
 - Developing guidelines for the EPC process structure, clear frameworks, definitions and standard contract provisions clarifying roles and responsibilities and formulating guidelines for the saving guarantees (Forsberg et al., 2007) in order to raise the confidence on the market;
 - Contractually regulating the case of unfulfilled guaranteed savings (Gottberg et al. 2009).
2. Raise the motivation of the private and public sector to engage in energy efficiency projects by:
 - Enforcing stricter environmental and energy efficiency legislation, mandatory and/or subsidized energy audits, metering systems, energy saving measurements, and factors influencing the electricity price could further develop the demand for energy services.
3. Overcome risk aversion through financial instruments by:
 - Legitimizing the business model by the development of an ESCO accreditation system and standardized measurement and verification systems;
 - In parallel with the accreditation system, recognizing the contractual model and offer of competitive loan guarantees;
 - Still in parallel with the accreditation system, establishing a fund for public-private projects where an institutional fund could enter as a co-investor (at market conditions) together with other private investors.
4. Increase capacity building with a national ESCO association by:

- Creating a support network for potential clients with capacity building, and giving direct advice and access to information (Forsberg et al., 2007);
- Developing clear and consistent client orientated communication of the EPC concept including information and evaluation of conducted EPC projects, best practices, guidelines and contract arrangements and implications (Gottberg et al., 2009; Forsberg et al., 2007).
- Organizing workshops and knowledge sharing events with ESCOs, potential clients (municipal representatives, facility managers, etc) and financial institutions in order to increase the knowledge of how ESCOs engage in projects and what benefits can ESCOs bring to project management from a risk reduction, financial and environmental perspective;
- Developing tools for an easy presentation of project's life cycle profits;
- Assisting clients in understanding and providers in recognizing the importance of concept of shared and guaranteed savings (Gottberg et al. 2009).

5. In order to increase the number of ESCO projects in the public sector:

- Adapt the public procurement laws in order to facilitate the evaluation of EPC providers and adapting the project cost evaluations in order to take into consideration lifecycle costs (Gottberg et al. 2009);
- Update the competition and procurement regulations by allowing group tendering by consortia and EPC providers to be evaluated on other grounds than previous EPC project experience would facilitate the entrance of new and smaller actors in the market (Gottberg et al. 2009);
- Introduce stricter environmental and energy efficiency criteria in public procurement;
- Develop guidelines for the procurement process, clear frameworks, definitions and standard contract provisions.

6. Introduce Energy Efficiency improvements and EPC in relevant academic curriculum (e.g. architecture, civil engineering, etc.) (Gottberg et al. 2009).

ESCOs could create added value to their services in terms of contributing to the environmental profile of their clients, demonstrating the value of monitoring the energy consumption and the ability to account the energy savings with a certification from an independent organization. ESCOs could offer their services also in the build up and performance of external and internal communication strategy.

Table 27. Summary of basic data of the Swedish ESCO Market

Number of ESCOs	5-10
Type of ESCOs	International medium sized manufacturers of building automation & control systems and facility & operation companies with EPC as a side business
ESCO Association	Forum for Energy Services

Size of the market	€60-80 M
Market development	Strong development but recently a limited number of new projects due to the financial crisis
Sector ESCO Projects & main EE measures	Mainly modernization and refurbishment of public buildings involving lighting, HVAC, complex refurbishments and fuel switch

United Kingdom

The United Kingdom (UK) is one of the most developed ESCO markets with a well established TPF market and intermediaries active in offering improved energy performance in the commercial sector. The energy service contracting market dates back to 1984, when subsidiaries of large energy companies and engineering companies started to include value added services such as project financing to their traditional offers (Sorrel 2005.). Historically, the UK ESCO market has been subject to quite important market restructuring due to the changing conditions in the energy market (the demise of the CHP 2000-2004, electricity trading arrangements in 2002, climate change issues 2005 onwards, and rising electricity prices) (DG EC JRC 2007).

As in Ireland, the terms EPC and ESCO are not widespread in the UK and instead ESCO-type work is referred to as Contract Energy Management (CEM), which is perceived as “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)” (DG EC JRC 2007).

Approximately 15-20 companies were identified in 2009 on the ESCO market where 5-6 offer and develop EPC. The major players are subsidiaries of large international manufacturers of building automation & control systems and energy service and supply companies providing facility management services e.g. Dalkia (Veolia), Honeywell, Cofely (GDF Suez), Siemens, Danfoss, TAC, JCI. These companies account for approx. 80% of the outsourced market, whilst mid-sized organisations such as Ener-G control the remaining 20% of the market. A growing number of construction, Facility Management and utility companies have entered the market during the last years, such as Carillion, GSH and British Gas. Smaller ESCO organisations find it difficult to position themselves on the market. For many of the above mentioned companies energy services are a key service offered together with a wider spectrum of other services.

UK’s Energy Services and Technology Association (ESTA)⁷⁶ is focused on demand side energy efficiency of buildings, building services and process services with 110 members (2009) including suppliers of products and services covering energy efficient monitoring, control, operation and management of buildings, building services and process services (ESTA 2010). ESTA defines ESCOs as an organisation responsible for delivering energy and other services (such as heating and cooling), where generally the contractual agreement includes the investment, maintenance and supply of a service with possibly elements of guaranteed performance.

⁷⁶ www.esta.org.uk

A number of large co-generation, district heating and supply side projects started during 2008 account for a large part of the market value of projects. In 2009, the majority of the ESCO projects were developed in the industrial sector (supply side with CHP and district heating), in the public sector (demand side) and in the private-non residential buildings sector. Business in the commercial sector is growing with a decreasing emphasis on CHP in comparison to previous years; this latter observation can be explained partially by the fact that maintenance contracts are extended with responsibility for energy use. On the contrary, the public sector continues to outsource energy management and services with infrastructure refurbishment. Although still small, renewable energy projects are becoming a growing element of the ESCO offering. Furthermore, according to UK's Energy Services and Technology Association (ESTA)⁷⁷, the ESCO concept is getting increasingly applied in Urban Development (ESTA 2010).

CEM (on the supply side) with guaranteed savings from better conversion or EPC (on the demand side) with guaranteed savings from energy equipment projects⁷⁸ are mainly offered to industrial sites, hospitals, universities and for district heating schemes. Shared savings and Public-Private-Partnerships (PPP) schemes in the public sector are also common.

Most projects are financed via TPF, the Private Finance Initiative⁷⁹ (PFI) and/or through local commercial banks lending to ESCOs or the clients, state funds and clients' internal funds.

2009 saw modest market growth. According to market experts the demand-side EPC with guarantees market is worth about €55 million/year, whilst the supply-side market is worth around €350 million/year. The potential size of the demand-side guaranteed EPC market in the UK non-residential sector is estimated at around €1 billion.

Several programmes and schemes have been introduced in the UK lately to promote energy efficiency investments, through CO₂ emission restrictions, financial instruments and private-public-partnerships and campaigns. These include the Carbon Reduction Commitment (CRC), the Enhanced Capital Allowances and the Annual Investment Allowance (AIA), the Carbon Emissions Reduction Target (CERT), the Buildings Energy Efficiency Programme (BEEP), the private finance initiative (PFI) and insulation grants (UK energy saving 2010)⁸⁰.

CRC⁸¹ is a new scheme introduced in April 2010. Aimed at reducing the carbon emissions of non-energy intensive organisations throughout the UK, the CRC is expected to effect about 5,000 organisations in both the public and private sector.

⁷⁷ UK's Energy Services and Technology Association (ESTA) is focused on demand side energy efficiency of buildings, building services and process services with 110 members (2009) including suppliers of products and services covering energy efficient monitoring, control, operation and management of buildings, building services and process services (ESTA 2010). ESTA defines ESCOs as an organisation responsible for delivering energy and other services (such as heating and cooling), where generally the contractual agreement includes the investment, maintenance and supply of a service with possibly elements of guaranteed performance.

⁷⁸ ESCO projects can be classified as demand-side energy performance contracting (with performance guarantee) and supply side activities.

⁷⁹ The PFI is a Public-Private-Partnership where private capital is used for the funding of public infrastructure.

⁸⁰ www.uk-energy-savings.com

⁸¹ For further information please visit:

<http://www.defra.gov.uk/Environment/climatechange/uk/business/crc/index.htm>

The CRC itself is a 'cap and trade' scheme. The cost of Carbon will be fixed at £12 / tCO₂ until March 2012. After that there will be a full bid process. Enhanced Capital Allowance (ECA⁸²) is a fiscal measure designed to reward companies that invest in energy efficient equipment (ESTA 2010). One source of funds for the public sector was established by the Carbon Trust⁸³, under a fund named SALIX, by allocating £140 million (corresponding to ca. €155 million) at 0% interest rate for energy efficiency projects. The Carbon Trust loans to the maximum value of 400.000£ are available both for SME and larger organisations not covered by the CRC. The Buildings Energy Efficiency Programme (BEEP) aims to help make the sustainable retrofit of existing public buildings financially feasible, enabling public bodies to radically cut CO₂ emissions from their buildings (LDA 2010).

The CRC is the strongest driver for the development of the ESCO market in the UK. Supply security and reliability, rising and volatile energy prices leading to cost uncertainty as well as the value of sustainability becoming a "moral obligation" used as a competitive differentiator are also considered as major drivers. In particular, the National Performance Indicators (PFI)⁸⁴, insufficient public budgets and ageing and inefficient energy plants in the public buildings with high backlog maintenance are important drivers in the public sector.

Regulatory and financial tools that are boosting the ESCO market include the Energy Performance in Buildings Directive (EPBD), the EU ETS and BEEP. BEEP is expected to expand across the public sector to all major cities in the UK and hopefully drive the awareness and acceptance of the process and benefits (guarantees and risk transfer) in the private sector. The Clinton Climate Initiative (C40) and the Climate Change Act are also seen as drivers. Directive 2006/32/EC is perceived to have lost important elements when translated into the national policy and few new incentives are offered by the Government to promote and support the growth of the ESCO industry.

The financial crisis is perceived as having created a lack of available funds, increasing the cost of capital and initiating a tendency to place non-core related investments on a lower priority list in times of market/customer insecurity. In 2009, the lack of appropriate forms of finance is said to be the most common barrier to ESCO projects followed by the lack of capacity, experience and awareness of how EPC works and its benefits relevant especially for demand-side EPC. Furthermore, there is instability perceived by ESCOs when working with private sector industrial clients and the belief by industrial customers that they can manage their energy consumption themselves.

Current and future policies and programmes perceived to have an impact on UK ESCO market include the CRC introduced at the beginning of the chapter, as well as policy documents such as the UK Low Carbon transition White Paper of July 2009, which introduces emission reduction targets of 34% by 2020 and the UK Renewable Energy Strategy, aiming at achieving 15% of UK's energy consumption from renewable energy sources. Feed-in tariffs for renewable electricity and heat are to be introduced respectively in April 2010 and April 2011.

Table 28. Summary of basic data of the UK ESCO Market

⁸² For further information please visit: <http://www.eca.gov.uk/>

⁸³ For further information visit: www.carbontrust.co.uk

⁸⁴ The National Performance Indicators include percentage of CO₂ reduction from local authority operations, per capita reduction in CO₂ emissions, etc. For further information visit: www.decc.gov.uk

Number of ESCOs	20
Size of the market	400 Million € / year
ESCO Association	Energy Services and Technology Association (ESTA) ⁸⁵
Type of ESCOs	Subsidiaries of large international manufacturers of building automation & control systems and energy service & supply companies
Market development	No significant growth
Sector ESCO Projects & main EE measures	public sector complex building projects and co-generation, district heating and supply side projects

2.2. European Union Candidate⁸⁶

Croatia

As of 2007 there was one Energy Service company in Croatia offering EPC. Three projects had been completed in the country with focus on public lighting and system improvements in educational buildings (EC DG JRC 2007). In 2009, besides a number of companies that occasionally deal with “ESCO type projects”, there are two small ESCOs present on the Croatian market (HEP-ESCO d.o.o and EETEK). HEP-ESCO is a daughter company of the national utility company, while EETEK is a subsidiary of an international group specialized as a facility management and operation company. Both ESCOs have energy services as their core business.

Most ESCO projects target complex building renovations involving the provision of energy services in the public sector. The refurbishment and modernisation of public buildings makes up 55% of the total number of energy efficiency projects and translates to 60% of the total investment value. Projects involve schools and hospitals. Measures targeted at street lighting improvement account for 33-42% of the energy efficiency projects (30% of total investment value). Projects involving the industrial sector are less common and represent 5-16% of the projects with 10% of the total investment value.

Energy performance contracts are used with guaranteed savings and shared savings contractual models. HEP-ESCO d.o.o. prepares finances and implements energy efficiency projects. The savings are initially defined in an investment grade audit and approved in the so called “post-installation report” carried out after project implementation. With the “post-installation report” a final calculation will reveal the portion of the investment which will be repaid to the provider with the energy savings achieved during a limited period of time (normally 5-8 years).

Projects are financed by loans by commercial banks to the client and/or to the ESCO and state funds. It is common for the ESCO and the client to both contribute to the financing.

The total value of ESCO projects is calculated by market experts to €10 million while the total potential of the Croatian ESCO market is estimated to €300 million. The

⁸⁵ www.esta.org.uk

⁸⁶ Iceland submitted its application for EU membership on the 16th of July 2009. However, since Iceland was not a candidate state during the research design nor during the primary data collection stage, Iceland's ESCO market is not addressed in this report

market size of projects in the non-residential sector, with a pay back time up to 10 years is estimated at €100-250 million.

The Croatian Fund for environmental protection and energy efficiency (FZOEU)⁸⁷ is a structured extra-budgetary fund which finances projects and activities in three areas: environmental protection, energy efficiency, and the use of renewable energy sources. FZOEU has funds for energy efficiency projects up to 1.700.000 kunas⁸⁸ per project. FZOEU and EBRD in Croatia offer subsidized interest rates for energy efficiency projects.

Since 2005 the UNDP in Croatia has implemented one energy efficiency project⁸⁹ aimed at removing barriers to energy efficiency. The program targets citizens and the private sector by promoting national and local energy efficiency information campaigns and free walk-through energy audits of buildings and recommendations for citizens. "House in Order" (HiO) is a second project which followed the UNDP Croatia's energy efficiency project targeting the public administration. HiO aims to implement EE and systematic energy management in all buildings owned by the central government.

BIOSOLESCO, an Intelligent Energy Europe project with the aim promote use of biomass and solar heat in both public and private sectors via ESCO approach and the Croatian Industrial Energy Efficiency Network programme (MIEE) have both been active in promoting the ESCO projects in Croatia.

Although the number of energy efficiency projects has been growing since 2005, in 2008 the ESCO market value has been stable to shrinking in comparison to 2005-2007. The increase of ESCO projects in the public sector was covalent with the decrease of ESCO projects in the industrial sector.

The funding given by FZOEU has been important in driving the ESCO market in Croatia. Improved marketing with information dissemination has also been important in raising the interest in ESCO solutions.

However, a number of barriers are hindering the development of the ESCO market in Croatia. Project financing is uncommon and the energy efficiency measures implemented by ESCOs are seen as products rather than services. In addition to the problems related to appropriate forms of finance, mistrust from the clients, small size of projects and high transaction costs (especially in street lighting), and public procurement rules are suggested as common hurdles. The decision making process is very long in public entities which raises the transaction costs. The strongest hindrance for ESCO projects is unstable customers. The solvency of private clients adds risk to projects and the reduced production level in the industrial sector has made ESCO projects less attractive. A lack of suitable projects has also been identified. Due to the conditions of the existing infrastructure, energy efficiency measures cannot be carried out without being part of a larger reconstruction/refurbishment project. Motivation for carrying out these projects is however limited when the investment cannot be covered by the energy savings achieved due to its large scope. In addition potential clients with access to know-how and financial resources prefer to carry out projects by themselves perceiving the price of the ESCO services as high. One factor influencing the price of using an

⁸⁷ For further information visit: <http://www.eihp.hr/english/obnovljivi1.htm>

⁸⁸ Equivalent to circa €236.000 in June 2010.

⁸⁹ For further information visit: <http://www.undp.hr/show.jsp?page=57802>

ESCO is the allocation of VAT on the energy efficiency equipment installed. The ESCO model is not recognized by the authorities as an individual business model providing a service but as delivering goods. Consequently, ESCOs need to pay VAT on the total equipment value at the moment of putting the energy saving equipment in operation. As a result, ESCOs cannot invoice their services as a package. In addition, due to the 2008-2009 financial crisis projects in the public sector have decreased because of municipal budget restrictions.

Table 28. Summary of basic data of the Croat ESCO Market

Number of ESCOs	2
Size of the market	€ 10 million
ESCO Association	No
Type of ESCOs	Energy service and supply and facility management and operation companies
Market development	No significant change
Sector ESCO Projects & main EE measures	Complex public building projects and street lighting

FYROM (Former Yugoslav Republic of Macedonia)

FYROM's primary energy intensity is 40% above the average of the EU 27, which translates in a substantial potential of energy conservation.

Specific information on FYROM's ESCO market is scarce. As of 2006 there was 1 ESCO-type company working with heating units and heat pumps on geothermal energy (EC DG JRC 2007).

In 2004, the government adopted the "Energy Efficiency Strategy until 2020". This strategy focuses on the adoption of technologies to provide for efficient energy use. Technical programs foreseen in the strategy include a residential building program which entail consumption based billing, extension of the district heating systems, insulation of windows, reflection shields for radiators, and thermostatic valves (E.V.A 2010).

An ongoing collaboration (2010-2012) between the Ministry of Economy of the Republic of Macedonia (MoE), the Austrian Energy Agency (AEA), and the Macedonian Energy Agency (EARM) aims at supporting the implementation of European energy efficiency legislation (in particular the EPBD) and carrying out a pilot project demonstrating energy efficiency measures in buildings.

Financial constraints were identified as the most important barrier to energy efficiency projects (EC DG JRC 2007). According to the Energy Regulatory Commission the lack of information and confidence in the industry and public sector, institutional capacity for project development, lack of institutional framework for renewable energy projects and access to finance and absence of mechanisms for favorable long-term credits all hinder project deployment (E.V.A 2010).

Table 29. Summary of basic data of the FYROM ESCO Market

Number of ESCOs	1 (2006)
-----------------	----------

Size of the market	N/A
ESCO Association	None
Type of ESCOs	N/A
Market development	N/A
Sector ESCO Projects & main EE measures	N/A

Turkey

As of 2007 there were no ESCO present on the Turkish market (EC DG JRC 2007). In 2009 there were 5 energy consultant companies registered as energy service providers by the regulatory body EIE⁹⁰ of the Ministry of Energy and Natural Resources. In addition, there are 33 organizations whose registration by the EIE is pending (as of October 2009). 3-4 companies can be considered pure ESCOs; 1-2 companies offer energy performance contracting. Companies that do not have the necessary technical or financial strength to offer performance guarantees offer services such as consultancy or audits. Most organizations operating in this sector have up to 10 energy professionals with the largest company employing up to 20 energy professionals. 80% of the ESCO-type companies are local companies 10% are big corporations or local branch of multinationals, and the remaining 10% are private consultants. A limited number of companies have energy services and supply as their core business; the majority is engineering consultancy firms and manufactures.

The industrial sector is the main target for ESCO projects due to its high energy efficiency potentials, followed by private non-residential buildings. Contract energy management and consultancy combined with audits is the most common contractual agreement in the Turkish ESCO market. Project financing mostly relies on client's internal funds.

The Turkish industrial and non-residential building sector represents high energy savings potentials, especially in heat and cooling services. The industrial sector accounts for about 50% of total electricity consumption and 40% of total primary energy supply while the private non-residential building sector accounts for 25% of total electricity consumption and 35% of total primary energy consumption.

A new Energy Efficiency Law⁹¹ was adopted in April 2007, which stipulates the role of ESCOs. The Law introduces obligatory audits, building codes, and an obligation for large energy consumers to employ energy managers (Ministry of Energy and Natural Resources 2007).

The interest in the ESCO concept has increased with the adoption of the Energy Efficiency Act, Turkey's signing of Kyoto protocol, Turkey's action plan on energy efficiency and the global trend towards green technologies. Increasing energy prices

⁹⁰ EIE stands for "Electrical Power Resources Survey and Development Administration".

⁹¹ The law can be found under the following link:

http://www.eie.gov.tr/english/announcements/EV_kanunu/EnVer_kanunu_tercume_revize2707.doc

have been a strong driver for energy efficiency measures and due to the economic growth and limited energy the energy price is expected to rise further.

However, borrowing for energy efficiency projects is still expensive. Commercial banks are not ready to lend on project basis, even less so based on future cash-flow. ESCOs are met with mistrust from potential clients. ESCOs need to gain further experience, improve their technical, financial and management abilities in order to develop the market. Furthermore, local financial institutions' lack of experience regarding project finance, specifically energy efficiency project finance, makes project implementation difficult and dependent on clients' internal resources. According to survey respondents, the technical, financial and legal infrastructure in Turkey is not yet appropriate for energy performance contracting.

The Turkish ESCO market actors need further experience and capacity development in order to explore and establish the market. The competence level of technical and financial stakeholders (ESCOs and financial institutions) needs to be enhanced. The possibilities for project financing could increase if local financial institutions see the possibilities of project financing. Furthermore, knowledge transfer is needed for energy efficiency project appraisal and implementation. Information and best practice dissemination addressed to potential clients in the industrial and building sector could increase awareness and acceptance.

Table 30. Summary of basic data of the Turkish ESCO Market

Number of ESCOs	5
Size of the market	N/A
ESCO Association	No
Type of ESCOs	Energy service and supply and manufactures
Market development	Strong growth
Sector ESCO Projects & main EE measures	Industry and private non-residential buildings

2.3. Other European countries

Norway

In 2005 10 companies defined themselves as ESCOs (EC DG JRC 2005). In 2007, the market had an estimated value of €30-€40 million in turnover and included 10-15 companies (EC DG JRC 2007). In 2009, the market has shrunk back to 5-10 active companies with €25 million in turnover.

Subsidiaries of international companies and local manufacturers of building automation & control systems, facility management and engineering consultancies are active on the market together with ventilation entrepreneurs (who only recently entered the market).

The majority of the ESCO projects carried out involve public buildings; the share of projects carried out in private non-residential buildings is lower. During 2007 – 2008, most projects were developed in the industrial sector. A smaller number of projects (but with a significant market value) involve building refurbishment and modernisation projects.

Projects are mainly carried out with contract energy management agreements although energy performance contracts with guaranteed savings are also offered. A small number of projects use shared savings with and without financing options. Projects are funded both by clients and ESCOs with internal funds or bank loans.

In 2008 the Norwegian state allocated approximately €45 million for energy efficiency improvement investments to be spread over 2-3 years.

EU co-financed projects (such as Eurocontract and the European Energy Service Initiative⁹²) and marketing efforts are perceived as driving factors of the ESCO industry.

Public procurement rules pose barriers to ESCO projects. Although financing ESCO projects has previously not been reported as a problem in Norway (EC DG JRC 2007), in 2009 the lack of appropriate forms of finance is considered to be the main barrier for project development. Mistrust from clients combined with the lack of time and skills among building owners in energy efficiency measures is lowering the attractiveness of ESCO projects.

The focus from national energy authorities on EPC is considered very low and a significant increase in energy prices for the industry and building owners is deemed essential in order to raise the priority of energy efficiency investments. The energy certification of buildings is expected to boost further energy efficiency improvement investments. More efforts and best practices are needed in order to further increase the knowledge and understanding of ESCO.

Table 31. Summary of basic data of the Norwegian ESCO Market

Number of ESCOs	10 Companies
Size of the market	€ 25 million
ESCO Association	No
Type of ESCOs	Manufacturers of building automation & control systems, facility management and engineering consultancies
Market development	Shrinking market
Sector ESCO Projects & main EE measures	Mainly public buildings with a lower share in private non-residential buildings

Switzerland

As of 2007 5-10 companies offered energy services (EC DG JRC 2007). In 2009, the energy contractors association Swiss Contracting identified 76 energy service companies carrying out energy efficiency investments in Switzerland. Most ESCOs in Switzerland are local energy producers and distributors seeing the energy performance contracting as a potential side business by exploiting synergies and offering added value services, such as 24-hour Emergency Service, meter reading, billing and collection.

Energy efficiency performance type contracts are concentrated on biomass-based and gas-based district heating. The average duration of the contracts is 15 years.

⁹² For further information please visit the following link: <http://www.european-energy-service-initiative.net/de/project.html>

Heat pump installations are also common. Contract energy management and performance based plant contracting, similar to BOOT, i.e. contractual agreements for the construction or renovation of new facilities (including design, construction, financing, operating and maintenance), are the main contractual models used. The shared savings model has also been introduced during the last 5 years.

Projects are financed by loans to the ESCOs from commercial banks and benefit from low interest loans reserved for renewable energy investments.

In 1999 the Federal Office of Energy estimated the ESCO market at €170 million/year. In 2009, Swiss Contracting estimated the ESCO market at €350 million/year and market participants expect the market to double within the next 5-7 years thanks to driving factors such as cost advantage and risk assessment (stable costs and guaranteed service).

Consulting and audit services of energy specialists are increasingly requested due to the constraints on production capacity and in order to create customer loyalty for energy distributors.

However, according to experts in the field, ESCOs are not commonly used due to in-house expertise and financial resources. The "low hanging fruits" within energy efficiency have already been harvested. Financing is a barrier for small contractors. The limited flexibility of ESCO contracting is perceived as a barrier for potential clients in the industrial sector. Industrial clients feel that the long contractual agreements are not suited for changes in demand.

Table 32. Summary of basic data of the Swiss ESCO Market

Number of ESCOs	76 energy contractors
Size of the market	€170 – 350 Million
ESCO Association	Swiss Contracting ⁹³
Type of ESCOs	Local energy producers and distributors
Market development	Slow growth
Sector ESCO Projects & main EE measures	District heating and heat pumps in buildings

2.4. CIS countries

ESCOs or ESCO-like companies have appeared in all the Commonwealth of Independent States (CIS) (including Russia, Belarus, Ukraine and Moldova), although the ESCO markets are still in an embryonic state (EC DG JRC 2007). Despite sizeable energy saving potentials (especially in the industrial sector), the following barriers were identified in 2007:

- The low energy prices damage the profitability of the ESCO business model and result in low consideration of the benefits of energy efficiency. Furthermore, energy consumption is not always metered but based on other variables such as square meters in the residential sector.

⁹³ www.swisscontracting.ch

- The legal system fails to clearly define asset ownership which discourages investments.
- The lack of data for energy consumption makes investment decision and energy consumption changes difficult.

(EC DG JRC 2007)

The 2009 survey added public procurement laws and lack of EPC knowledge as additional barriers. Rules for public finance and procurement laws constrain the possibilities for flexible energy performance contracts in the public sector. Local knowledge of EPC amongst municipal government and potential ESCO companies in the engineering or constructions sectors is very limited. Similarly in the banking sector knowledge of EPC is very limited resulting in lack of interest or readiness amongst banks to take financing risk against EPC contracts.

Belarus

The information on the Belarusian market is scarce. As of 2007 1 project has been implemented by an ESCO that entered the Belarusian market in 2005. The project was carried out with a UK Energy Management Contractual model and the ESCO provided a turnkey solution (EC DG JRC 2007).

Several barriers have been identified for a successful establishment of an ESCO market, such as the fixed electricity and heat tariffs, accounting and taxation system, constraints of the banking system and procurement rules.

Potential ESCOs are expected to focus on industries and energy generation and distribution.

Moldova

In 2010 Moldova acceded to the Energy Community, taking a decisive step for harmonising its market rules with EU legislation.

Despite a supportive legal framework, a very low priority has been put on energy conservation and energy efficiency investments.

The relative instability of the economy affects potential ESCOs' willingness to engage in guaranteed long-term contracts (EC DG JRC 2007).

Russia

ESCOs are an innovative concept in Russia. Despite the interest from companies in the private and public sector, the 2009 survey points out that currently there is no ESCO operating in Russia.

Companies operating as providers of energy services are of quite small size; some offer ESCO-type contracts as an added value to their core business, such as energy equipment manufactures integrating the ESCO concept into energy supply business.

CEM is used in a limited number of private buildings or industrial clients. Most projects are co-generation projects with the installation of auxiliary energy equipment, such as industrial and municipal boilers.

A number of regions are piloting municipal energy efficiency service projects e.g. to install energy meters. Technology providers (manufactures) sometimes perform contractual agreements which include an audit, installation and operation of the

equipment with extended payment terms through leasing. These contracts (and the related repayment) are not performance based.

Equipment manufactures can finance the contract through leasing companies and commercial banks. Bank loans and clients' or providers' internal funds account for financing the remaining part of the projects.

The size of the market is still unknown since data on the energy consumption for different sectors is difficult to obtain.

Most households nowadays pay for their metered electricity consumption, but only a fraction of water, gas and heating consumption is metered and billed accordingly. The Ministry of Regional Development has prepared a draft decree on the provision of housing and public utility services. The draft decree reflects the aim to have a wide-spread installation of individual energy meters and is expected to enter into force in January 2011. Once the Decree enters into force, the energy bill for consumers without a corresponding meter will be increased 2-4 times.

According to the Russian Energy Strategy 2020, energy consumption in Russia should be lowered by 40% to 48% by 2020 (as compared to 2000 consumption) through effective energy efficiency measures and structural change in the Russian economy (EC DG JRC 2007). According to the findings of the EU-Russia Energy Dialogue Technology Centre (2006), a supportive and predictable legislative system with higher energy prices is needed for the ESCO concept to expand in Russia. While the legislative framework is often non-supportive, there is an immense potential of "low hanging fruit" projects.

A new Energy Strategy of Russia until 2030 was adopted by the Russian government on 13 November 2009. On the 23rd of November 2009, the Russian president signed a new Law on Energy Savings and on Improvement of Energy Efficiency in the Russian Federation, including the amendments to more than 40 legislative acts. Among others, the new Law on Energy Savings and on Improvement of Energy Efficiency assigns a certain importance to ESCO as a business model within the energy field.

The Government's Program for Energy Conservation includes financial support for energy efficiency and renewable energy projects, innovation and technologies. Energy efficiency action plans at regional level were developed in 2009 and the Russian Energy Agency (REA) was set up in December 2009 as a supporting agency for energy efficiency at all levels. Although there are no ESCO experts in the current set-up, some organisations are interested in developing the new business model starting at a regional level by developing pilot schemes and verifying their workability within the Russian legal framework at a municipal level. The Russian government is now working to prepare specific legislation to support EPC activities in Russia, particularly in the public sector⁹⁴.

Lack of appropriate forms of finance, public procurement rules, unstable customers, and a perceived high business and technological risk are seen as strong overarching barriers that hinder ESCO market development. In the private sector, the mistrust of companies towards external consultants and service companies and the inexperience of outsourcing service and utility supply are seen as the strongest

⁹⁴ For further information visit (in Russian):
http://www.minregion.ru/documents/draft_documents/428.html.

hindrance. Outsourcing of energy and allowing external companies to interfere in the internal process is considered too risky. Moreover, energy efficiency investments are not very high on the corporate agenda, which also undermines demand for ESCO services. Finally, there is poor energy management culture at most companies (i.e. lack of metering), which makes it hard to establish baselines and to measure the effectiveness of energy savings achieved by ESCOs. In the public sector (e.g. public buildings), the development of ESCOs is impeded by the lack of enabling legislative and regulatory framework e.g. the ability for budget institutions to enter into long-term contracts, retain energy savings, guarantee budgetary payments according to the baseline energy consumption, etc.

The financial crisis has not improved the situation – on the contrary, it has resulted in a tightened access to finance by all stakeholders.

The financial crisis has brought some energy efficiency projects in the private sector to a standstill. Companies cut their investment plans, including for energy efficiency and operational activity. However, the lack of own capital of private companies and municipalities has led to an increased interest to third-party ESCO financing and solutions.

The new energy efficiency law (November 2009) introduces provisions that all buildings must have an energy certificate, the national building regulations on energy efficiency are to be revised every five years, major renovations should follow advanced energy efficiency requirements, and new apartment blocks and renovated buildings should be equipped with water, heat, gas and electric power meters. The law is expected to introduce tax incentives, preferential loans and accelerated depreciation to raise the attractiveness for energy efficiency investments. The law also introduces specific provisions to support EPC activities in Russia including guidelines on EPC provisions and the possibility for model contracts within the regulations.

The large potentials for energy savings, liberalisation of energy prices and the new energy efficiency regulation are expected to have a positive effect on the market. Expected developments for the coming years in the public sector include lighting refurbishment projects, urban lighting, energy conservation, and energy efficiency in the residential sector.

Ukraine

The first commercial ESCO (UkrESCO) was established in 1998 with a sovereign loan from the EBRD and a grant from the European Union's technical assistance programme (TACIS). As of 2007, 2 public and 1 private ESCOs were active on the market. The target market for developing ESCO projects was mainly industrial sites, SMEs and municipal energy efficiency. The main barrier for further development has been the difficult access to finance due to high interest rates and the fact that energy tariffs were being kept artificially low (EC DG JRC 2007).

As of 2009, there were about 30 small local companies providing energy audits, energy consulting, information services, and energy efficiency project management. Company size varies between 3 and 15 employees. ESCOs in Ukraine are said to act as middlemen between banks, equipment manufactures and clients. There is a strong focus of ESCO projects in industry and ESCOs' core business revolves mainly around energy audits and equipment manufacturing (specifically for heat recovery

and CHP). These companies have developed special divisions and offer ESCO type projects as an added value to their services in the core business activity.

Projects are still mainly in the industrial sector (90%), with district heating getting a small share (5%), along with renewable energy sources (2%), public buildings (1%) and co-generation (0.5%).

Chauffage and BOOT are the most common contract types used. Projects are financed by leasing, loans from commercial banks to the client, the client's internal funds, and subsidies. Only in rare cases does ESCOs provide equity for project financing. Performance guarantees are rare, ESCOs prefer to focus on the provision of a turn-key solution designed to deliver a specific but not guaranteed level of minimum energy savings.

No estimates exist of the current market size. A proxy of commercial activity is that, for instance, a small ESCO-type company (about 15 employees) can have 3-4 energy audits a year for projects with a capital intensity of €4-30 million.

The market has been growing steadily in the past years due to increasing customer knowledge and reference projects, increasing energy prices and energy campaigns encouraging energy conservation and positive feedback from the banks. Information dissemination and public debates about energy prices, environmental impact, renewable energy sources, energy efficiency and partly ESCO services have had an important positive effect on the market. National and international environmental funds, new legislation and energy tariffs are also identified as important market drivers.

Mistrust from the clients, public procurement rules and small size of projects and high transaction costs are perceived as important barriers. Energy price is the main factor expected to influence the ESCO market.

Due to the economic crisis the refurbishment and replacement investments have rapidly come to a halt, blocking a number of projects under development and the initiation of new ones. Interest rates went up by 1-2% extending the payback time of projects. On the other hand, despite the reduced number of projects in the private sector, the number of projects in the public sector – such as district heating modernisation - has increased.

No regulatory or financial support is focused on energy services. Work is now underway to develop EPC models for use in the public sector and to identify regulatory improvements which would enable more widespread use of EPC approaches in Ukraine. It is indicated that the Ukrainian industry needs significant investment in energy efficiency in the range of €60-75 billion, while the municipal utilities need investments in building renovation amounting to €7-15 billion. What fraction of this estimated investment needs is suited for the ESCO concept is unknown.

Although no relevant actions have been taken in order to support energy efficiency services, public authorities are willing to develop an energy efficiency market. Building energy performance certificates are identified as an important tool to increase energy efficiency investments.

Table 34. Summary of basic data of the CIS ESCO Market

Countries	Russia	Belarus	Ukraine	Moldova
Number of ESCOs	N/A	None	30	None
Size of the market	Na	N/A	N/A	N/A
ESCO Association	N/A	N/A	N/A	N/A
Type of ESCOs	Energy suppliers and energy equipment manufactures	N/A	Energy auditors and equipment manufacturers	N/A
Market development	Expected growth due to new energy efficiency law	N/A	Steady growth	N/A
Sector ESCO Projects & main EE measures	Co-generation projects with the installation of auxiliary energy equipment such as industrial and municipal boilers	N/A	In the industrial sector	N/A

2.5. Non EU South East Europe

The non EU South East Europe (SEE) states are characterized by rapidly growing economies as a result of reconstruction after the war period. This change is accompanied by rapidly rising energy demand, along with initially high energy intensities. The reconstruction period has seen a strong emphasis on legislative modernization that also takes into consideration the harmonization with European Union Directives and international agreements.

In order to establish an ESCO market, the SEE states need to acquire a better understanding of the ESCO concept, reference projects, and access to finance (lower interest rates).

Albania

Despite having a National Energy Strategy (NSE) highlighting Energy Service Companies and Third Part Financing (NSE 2005), as of 2009, experts confirm that there are no ESCO operating in Albania.

Albania is still considered a few steps away from initiating ESCO businesses. Some of the remaining obstacles listed by experts are the further improvement of the legal and regulatory framework, the lack of appropriate and accessible financial resources and low awareness (EC DG JRC 2007).

Bosnia and Herzegovina

The ESCO concept appears to be uncommon, yet not unknown in Bosnia and Herzegovina (BiH) already in 2005 (Chabchoub 2005). In 2009 no ESCO is operating in BiH except for some isolated energy efficiency service projects, such as a local environmental consultancy that has done 5 energy audits (as part of TAM-BAS program).

Sarajevo city authorities are organizing Energy Efficiency Seminars aiming at energy efficiency improvements in household buildings.

Due to the heavy industry in the country that employs energy intensive technology and because of the lack of project financing schemes (such as subsidies and leasing), the ESCO model is expected to cover a real market demand and enable energy savings opportunities in the industrial sector (Sehovic 2005).

However, in BiH, each industrial complex / factory with high energy demands has its own technical services unit that takes care of energy management, which affects adversely the need to outsource this type of service. Barriers to the deployment of ESCO projects identified in 2007 include unclear authority and legislation and lack of data, confidence and access to finance (EC DG JRC 2007).

Republic of Montenegro

According to experts in the field there are no ESCO companies active in Montenegro. A new Energy Efficiency Law (EEL) was adopted by the government in February 2010. The new EEL gives legal framework for ESCO market development in Montenegro. The EEL targets energy efficiency in final energy consumption. The energy efficiency in the production, transmission and distribution of energy is regulated by the new energy law adopted by the Government in January 2010.

The new EEL is compliant with European energy efficiency directives such as the Energy End-Use Efficiency and Energy Services Directive (Directive 2006/32/EC) and the Energy Performance of Buildings Directive (Directive 2002/91/EC). Furthermore, the new EEL also includes an energy efficiency strategy and NEEAP (Pavlović 2010).

Republic of Serbia

Serbia has very high energy intensity combined with low energy consumption per capita. Moreover, due to poorly isolated buildings and the use of electricity for heating, the residential sector accounts for 70% of the energy demand (ASE 2010). The local government and suppliers subsidize electricity prices by about 80% and district heating by 40-70%. Yet, heating bills constitute approximately 33% of an average monthly salary (MUNEE 2010).

As of 2007 there was no ESCO activity in Serbia. The concept was being disseminated, but without leading to any concrete projects (EC DG JRC 2007). In 2008-2009, the ESCO concept is still little known and isolated actions are in progress from very few private companies willing to provide ESCO services on the market. Around 10 small engineering companies and manufacturers of building automation & control systems are offering a broad range of comprehensive energy saving solutions including energy audits, providing or arranging for project financing, design engineering, providing operations and maintenance services. The providers are both

national and international and some have energy services as their core business. EPCs are not used, however contracts including guaranteed saving are provided.

The most relevant promotion of ESCO concept is done by an engineering company which offers a full range of energy services, starting with an energy audit and including finance arrangements. However, the compensation is not related to the amount of energy saved and the company is only in charge of implementing the energy conservation measures and monitoring the results. Energy efficiency projects using this business model are developed in the industry and public buildings sector. A lower number of projects are also developed in co-generation and street or indoor lighting. Potential sources of financing are loans from local commercial banks or ESCOs' own equity.

The Serbian government is attempting a comprehensive program of energy sector reform that includes adoption of an Energy Sector Strategy covering all sub-sectors, restructuring and commercialization of energy companies, tariff rationalization that incorporates life-line tariffs, and decreasing energy costs through an energy efficiency program. Serbia's Energy Sector Development Strategy until 2015 (2005) addresses, among others energy efficiency targets and ESCOs (Golusin, Tesic et al. 2010).

The market for energy efficiency services is perceived to have grown since 2008. Due to the need for lowering operational costs, the financial crisis has had a positive impact on energy efficiency projects in Serbia.

Demonstration projects that receive international funding are the strongest driving factors for the market. The World Bank, the EBRD and KfW offer credit lines for energy efficiency projects⁹⁵.

The most important barriers to energy efficiency services in Serbia are the lack of appropriate forms of finance and public procurement rules.

Serbia has a large market potential for implementation of energy savings measures and renewable sources of energy. Serbia is advancing fast towards a fully liberalized energy market. The new situation presents good opportunities for implementing ESCO concept in Serbia where ESCOs can play an important role in the implementation of energy efficiency projects. However, the success of the Energy Sector Strategy will very much depend on its implementation, on the secondary legislation required for implementation, on the efficiency of the newly established institutions and the capability to enforce the law effectively.

⁹⁵ For further information on investment programmes, projects and FDI read: Golusin, M., Z. Tesic, et al. (2010). "The analysis of the renewable energy production sector in Serbia." *Renewable and Sustainable Energy Reviews* 14(5): 1477-1483. Available at: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VMY-4Y9YXKH-3&_user=4900406&_coverDate=06%2F30%2F2010&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1269267582&_rerunOrigin=google&_acct=C000036252&_version=1&_urlVersion=0&_userid=4900406&md5=5a065379e8be86ee99b972587f8adfd1

Table 35. Summary of basic data of the CIS and non-EU SEE ESCO Market

Countries	Serbia	Montenegro	BiH	Albania
Number of ESCOs	10	None	None	None
Size of the market	Na	Na	Na	Na
ESCO Association	Not known	Na	Na	Na
Type of ESCOs	10 small engineering companies and manufacturers of building automation & control systems	Na	Na	Na
Market development	Growing	Not known	Not known	Not known
Sector ESCO Projects & main EE measures	Industry and public building projects			Na

3. Conclusions

Table 36 summarises the developments in national ESCO markets in Europe in the period 2007-2010. As can be seen from the European ESCO market summary table (table 36), the market development and structure in countries covered in the present report vary significantly. This chapter summarises the trends identified in the market and draws conclusions about common barriers that hurdle ESCO market development. Success factors that facilitate the uptake of the ESCO business model have also been identified. Finally, a set of recommendations is provided for a further ESCO market development.

Table 36. Developments in national ESCO markets in Europe: 2007-2010

Country	Change	Nr. ESCOs	Categories of energy service providers	Projects
Albania	N/A	None	N/A	N/A
Austria	Steady growth	5-14	Mainly Energy service & supply companies and consulting/engineering firms.	Supply side projects, complex building projects involving more energy services, and street or indoor lighting
Belarus	N/A	None	N/A	N/A
Belgium	Stable growth	7 large and 5-7 small	Larger international Manufacturers of Building Automation and Control Systems	Public buildings, HVAC and control and cogeneration
Bosnia Herzegovina	N/A	None	N/A	N/A
Bulgaria	Slow growth	20	Manufacturers of Building Automation and Control Systems	Public buildings involving lighting and HVAC and complex refurbishment projects
Croatia	No significant changes	2	Energy service and supply and facility management and operation companies	Complex public building projects and street lighting
Cyprus	N/A	N/A	N/A	N/A
Czech Republic	Stable growth	8-10	Manufacturers of Building Automation & Control Systems and energy services and supply companies	Public buildings involving HVAC-control system installation, boiler houses, lighting and pipes insulation.
Denmark	Strong growth	10	International small sized Manufacturers of Building Automation & Control Systems and facility & operation companies	Mainly modernization and refurbishment of public buildings and industrial projects
Estonia	N/A	2 (in 2007)	N/A	Public sector involving public lighting, control

				and automation systems (2007)
Finland	No significant changes	8	Both national and international companies Manufacturers of Building Automation & Control Systems, facility management and Operation & Control companies and consulting/engineering	Industry sector projects involving process or horizontal technologies and motor systems with a smaller percentage in public buildings
France	Growth	10 big and approx. 100 smaller actors	Facility Management and Operation Companies, Manufacturers of Building Automation & Control Systems	District heating, CHP, Public buildings and private non residential buildings
FYROM	N/A	1 (in 2006)	N/A	N/A
Germany	Stable growth	250 – 500	Energy suppliers and Manufacturers of Building Automation & Control Systems	Public and private non residential building projects and Cogeneration, district heating and renewables through CEM
Greece	Market initiation	2	Energy Services and facility management companies	Industrial and tertiary sector involving thermal solar heating
Hungary	Fluctuation	20-30	Local SMEs, daughter companies of energy suppliers, multinational ESCOs	Mainly in public sector, some in residential and CHP/renewables, lighting, heating, boilers, energy system operation, CHP, and block house renovation
Ireland	No significant changes	15	Consulting and engineering firms, energy service & supply companies and facility management companies	BOOT CHP and supply side projects
Italy	Growth	50 - 150	Subsidiaries of International Groups with core business in Energy Service	Renewable, Cogeneration, Industry and lighting

			Provision, mainly small-medium sized	
Latvia	Strong growth	5	Engineering consulting firms and energy services and supply companies	Co-generation & other supply side projects in the industrial sector involving more energy services
Lithuania	Slow growth	6	National and international Manufacturers of Building Automation & Control Systems	District heating, co-generation and public buildings sector
Luxemburg	N/A	3-4 (in 2007)	N/A	N/A
Malta	N/A	None (2007)	N/A	N/A
Moldova	N/A	None	N/A	N/A
Montenegro	N/A	None	N/A	N/A
Netherlands	Stable growth	50	Construction and engineering companies	Energy systems in medium-sized and large non-residential new building projects
Norway	Shrinking market	10	Manufacturers of Building Automation & Control Systems, facility management and engineering consultancies	Mainly public buildings, lower share in private non-residential buildings
Poland	No significant changes	3-10	Energy services and supply companies	Street and indoor lighting and co-generation in the public sector
Portugal	Slow growth	10-12	Small companies started as Public-Private Partnerships and subsidiaries of larger national or multinational companies	Buildings, outdoor lighting, industry involving cogeneration, micro-cogeneration, audits, lighting, energy recovery, motors and drives
Romania	Strong growth	14	Consulting and engineering companies, facility management and operation companies, energy service & supply companies, equipment suppliers and dealers	Mainly in industry (industrial processes and co-generation) and less in public sector projects (district heating and street-lighting measures)
Russia	Shrinking	N/A	Energy suppliers and	Co-generation projects

	market		energy equipment manufactures	with the installation of auxiliary energy equipment such as boilers in the industrial and municipal sectors
Serbia	Growth	10	Small engineering companies and building and control manufactures	Industry and public building projects
Slovakia	No significant changes	2-5	Energy consultant companies, building and control manufactures, and energy service companies	Complex building projects and co-generation
Slovenia	More actors but no significant change in the market size	2-5	Energy services	District heating and street lighting
Spain	Growth	> 15	National and international large utilities, construction and multi-services companies	Public Buildings, private non-residential buildings, and industries involving cogeneration, audits, HVAC control systems, lighting
Sweden	Strong growth	5-10	International medium sized building & control manufactures and facility & operation companies with EPC as a side business	Mainly modernization and refurbishment of public buildings involving lighting, HVAC, complex refurbishments and fuel switch
Switzerland	Slow growth	76 energy contractors	Local energy producers and distributors	District heating and heat pumps in buildings
Turkey	Steady growth	5	Engineering consultancy firms and manufactures	Industry and private non-residential buildings
Ukraine	Steady growth	30	Energy auditors and equipment manufacturers	Industry
United Kingdom	No significant change	20	Subsidiaries of large international Manufacturers of Building Automation & Control Systems and energy service &	Industrial and large commercial applications, complex building projects and co-generation, district heating and supply side projects in

3.1. Latest developments

The following trends are revealed when comparing the ESCO market in 2010 with the situation identified in the *Status Report 2007*.

1. Increasing awareness

The awareness and understanding of energy efficiency services has increased and providers are met with a lower degree of mistrust compared to previous years. The rise in energy prices (increasing the importance of energy consumption in cost efficiency) and a shift in mindsets related to defining energy efficiency as both a competitive advantage, tool to improve the green image of an organisation and moral obligation related to environmental awareness are all factors for the raised awareness. The knowledge of the ESCO concept has also increased, creating more confidence in the market, where potential clients start to consider energy efficiency services more business-as-usual than as a specialty. In some countries, financial institutions have acquired more experience in financing energy efficiency projects and in taking into consideration the guaranteed savings offered by some ESCOs and energy performance contracting. For instance in France, finance institutions can cover the risk of the guaranteed savings by insuring the savings. Yet, low awareness of the specifics of the ESCO model and scepticism towards its advantages among both clients and financiers remains one of the most commonly reported barriers to the deployment of ESCO projects in the large majority of countries surveyed.

2. Enabling public procurement rules

Public procurement rules and evaluation criteria in the public tendering process remain the main barrier for ESCO project development in the public sector. However, significant improvements have been achieved in some countries in removing these barriers and/or by establishing procedures that favour ESCOs. 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 to 20 years. The new Energy Efficiency agreements 2008-2016 in Finland aim at ensuring that the Municipalities are able to use ESCO services when implementing energy efficiency investments.

In an increasing number of countries local authorities can retain the financial savings generated from energy saving projects, which has a crucial impact on their ability to enter into contractual arrangements with ESCOs.

3. Active public support

Public authorities have been increasingly active in supporting the development of an ESCO market in some countries by preparing ESCO model contracts, opening credit lines, working with public banks and preparing calls for tender to implement energy services in public buildings. In Sweden, to spur EPC projects, the Swedish Energy Agency (STEM) is pursuing a "portfolio of flexible mechanisms" which include the formation of an ESCO network, customer oriented information, guidelines for the procurement process, model contracts, and project evaluation. The role of public support is to enhance both the demand for energy services and the supply of services, including by establishing appropriate framework conditions that channel private financing in the sector.

4. Economic downturn

The financial crisis and economic downturn have had important impacts, both positive and negative, on the initiation and development of ESCO projects. The economic downturn made ESCO clients more unstable, reducing their activity, increasing the difficulty in ensuring energy savings and raising the risk of insolvency. The economic downturn has also raised the importance of contractual flexibility. On the other hand, the financial crisis and economic restrictions have focussed the attention on achieving cost reductions through energy efficiency measures and taking advantage of the flexible financing mechanisms offered by ESCOs. In order to counterbalance the economic downturn, many projects have been initiated in the public sector with financial incentives for projects in the private market (especially related to building refurbishment).

The shift in new projects from the industrial sector to public buildings has been related to the tightened access to finance in the private sector and higher investment risks.

5. Diverse market trends across national markets

The ESCO markets did not undergo any major market development in the larger part of the New Member States since the ESCO status report 2007 was published. Problems related to the stalling of the ESCO market in these countries often depend on the problematic access to finance, cross-subsidised energy prices and the unavailability of energy consumption data to construct baselines. In other states (such as Finland, the United Kingdom and Norway) the awareness and understanding of the ESCO market has increased, but without experiencing any rise in project implementation or market volume. In Norway, the number of ESCO has actually decreased during the past years with a shrinking ESCO market. The main barrier in these markets is the access to finance, which can be partly related to the economic downturn and financial crisis.

In 2007 a number of countries outside the European Union, such as Turkey⁹⁶ and Ukraine⁹⁷ had ESCO markets in an embryonic state. By 2009 they have established a market with a high number of active market actors. In these countries the market transformation is related to changes in the legal framework and the availability of grants for project financing. Some European member states, such as Sweden, Italy, Spain and Denmark, have undergone a significant growth over the past years. The drivers for this strong growth differ among countries, but can be associated with improved efforts and tools to develop the ESCO market (some related drivers will be highlighted in the following section on success factors).

3.2. Common barriers

Barriers that hamper the deployment of the ESCO concept and EPC are identified below.

1. Ambiguities in the **legislative framework, including the public procurement rules** remain one of the most important barriers. Procurement procedures are often complex and time consuming, which adds up to the transaction costs of

⁹⁶ The ESCO market in Turkey grew from having no ESCO activity to 5 registered energy consultant companies and 33 organizations waiting to be registered.

⁹⁷ The ESCO market in Ukraine grew from 3 ESCOs in 2007 to 30 small local companies active in conducting energy audits, energy consulting, information services and project management for energy efficiency projects 2009.

projects, undermining their viability. In some jurisdictions the public tendering regulations require the applicants to have experience in all relevant project specific sectors, which hinder the entry of new and less established market actors. In France, the legally regulated contractual agreements for project development in the public sector are seen as a major hurdle for the introduction of the energy performance contracting.

Moreover, in most countries lifecycle costs that also account for maintenance and energy costs are not used in public procurement, which poses a disadvantage to EPC projects that may have a higher initial investment cost. Direct cost comparison of different energy supply options is often difficult, as experience in Germany shows.

The legal definition of the product provided by ESCO-type of contracts may have important adverse impacts, especially related to the taxation status of ESCO projects. For instance, in Croatia the ESCO model is not recognized by the authorities as an individual business model providing a service, but as contract delivering goods. Consequently, ESCOs need to pay VAT on the total equipment value at the moment of putting the energy saving equipment in operation.

The international accounting rules (IFRS for operational and finance leases) are still perceived as a common barrier due to the unsuitability to the ESCO model⁹⁸, but have lost relevance in comparison to earlier studies carried out for the Status Report 2007.

2. **Low and fluctuating energy prices** decrease the economic potential for energy savings.
3. The **lack of reliable energy consumption data** makes it difficult to establish baselines and hence provide reliable data on actual savings.
4. The **financial crisis and economic downturn** has made access to finance more difficult in the large majority of countries surveyed. In Spain, Belgium, Finland, Denmark, Czech Republic, Poland, and Ukraine this has been identified as the most common barrier.

The financial crisis has influenced the initiation and development of projects due to the tighter access to loans, higher interest rates, stronger securities needed (for instance in Spain), reduced investment budget of clients, higher insolvency risk of clients and reduced the availability of providers to engage in long term contracts (Czech Republic).

In some countries, the economic crisis lead to freeze in refurbishment and upgrading investments, blocking a number of projects under development and the initiation of new ones.

In addition, despite an increased knowledge of energy efficiency projects, lending remains primarily asset-based. Financial institutions are still cautious with cash-flow based lending.

⁹⁸ In the case of an operating lease the annual contracting fee needs to be booked as revenue while the unbilled receivables are reduced. This operation in the balance sheet can have a negative impact on the credit rating. In the case of a financial lease, the total revenue needs to be booked at the end of the project and therefore annual booking is not allowed. In this case, the ESCO needs to finance the VAT for the whole duration of the project. For further information on IFRS, please visit www.ifrs.com.

5. **Real and perceived high business and technical risks remain strong barriers.** The business and technical risks are related to the following issues:

- the perceived risk that the energy efficiency interventions might compromise the production or operation processes related to the core business;
- the aversion to outsource energy management, especially where in-house technical expertise exists. Yet, energy efficiency investments are rarely high on the corporate agendas, which often hinders the actual implementation of measures in-house;
- the lack of flexibility and long commitment required with ESCO contracts;
- small size of projects.

In the Netherlands, intervention that could compromise the core business such as energy management in SME and “non-standard” energy use in the commercial sector are met with scepticism. In specific industrial sectors, ESCO projects are restricted to areas outside the core process. In Austria and Spain, outsourcing energy management is often met with resistance from the technical department and internal project development is preferred when the financial resources and know-how are available (or delayed when either of these is not available).

6. In some countries, there is still a high level of **mistrust** in the ESCO model both from customers and from financing institutions. The lack of standardization is perceived as the most important motive for this mistrust. In addition (and partly related to the lack of standardization) the following issues have been identified as reasons for mistrust:

- inhomogeneous ESCO offer, which makes standardization of contracts difficult;
- lack of competition in some market segments;
- lack of experience of clients, ESCOs and financial institutions;
- absence of widely disseminated best practices with a clear client focus;
- unclear definitions and failed contracts;
- lack of standardized measurement and verification of project savings;
- complex contracts.

Although the level of awareness has increased during the last years, a certain level of mistrust from the customers still remains. The mistrust has many origins. In Austria, mistrust from the clients is mainly based on bad experience with energy consultants. In Sweden, the lack of confidence is created by the absence of credible and visible reference cases with a clear client focus. In the Czech Republic, mistrust (perceived as the main barrier) is based on the scepticism by management towards energy efficiency investments, the complexity of the ESCO solutions, unclear definitions and failed contract. In the Netherlands and Poland a low level of confidence is present in the market due to the absence of standardization and a specific legal framework for energy performance contracting.

In addition, the complex definition of a baseline with external factors influencing energy consumption hinders the establishment of simple contractual agreements

particularly for contractual agreements including shared savings. The monitoring required by energy performance contracting is considered costly and time consuming, especially for projects of smaller scale. On the other hand, no performance can be guaranteed in the absence of a sound monitoring system.

The lack of or insufficient competitiveness to meet the costumers' needs has been identified with the lack of skilled staff (Sweden, Spain, Turkey, etc.). ESCOs need to gain further experience, improve their technical, financial, management and marketing abilities in order to develop the market.

Local financial institutions often lack the experience in project financing and the financing of energy efficiency measures, and the evaluation of new concepts (such as guaranteed savings) restricts the access to finance. Experience in a few countries shows that financing institutions only build up or scale up their expertise when they start seeing energy efficiency businesses as a promising market niche.

7. **Collaboration, commitment and cultural issues** are still seen as an important limitation for the development of the ESCO concept.

The high level of collaboration required between the client and the provider can be perceived as resource consuming, while the commitment issues are largely related to the long contractual terms and low flexibility that characterize the ESCO model. The cultural clash has mainly been observed within Scandinavia, where the concept of energy efficiency measures is strongly connected to concept of "moral obligations". Therefore a business idea where the provider earns money from the energy savings of a second organization is not well accepted.

3.3. Success factors

As highlighted in the *Status Report 2007* there are various enabling and driving factors, which support the creation and growth of ESCO markets in the different countries.

The number of policies and actions set up with the objective of directly supporting the ESCO market are limited. However, a number of legislative, structural and market related changes have fostered some national ESCO markets by producing indirect effects on the supply of and the demand for energy efficiency. Annex VI provides a list of eligible energy efficient procurement measures; Member States have been required to select a minimum of two requirements from the list in the context of the exemplary role of the public sector referred to in Article 5 of the Directive.

1. Supportive policy frameworks and implementing measures

Relevant supportive policies and measures have been implemented on national and European level. A number of legislative acts address energy efficiency and have direct or indirect impacts on the demand for Energy Services.

The purpose of the Directive on Energy End-Use Efficiency and Energy Services (2006/32/EC) is make the end use of energy more economic and efficient by establishing indicative targets, incentives and the institutional, financial and legal frameworks needed to eliminate market barriers and imperfections which prevent efficient end use of energy. The Directive creates the conditions for the development and promotion of a market for energy services and for the delivery of energy-saving programmes and other measures aimed at improving end-use energy efficiency.

In transposing and complying with the Directive, Member States must ensure that energy distributors, distribution system operators and energy retail businesses that sell electricity, natural gas, heating oil and district heating refrain from any activity which could hamper the supply of energy services, programmes to improve energy efficiency and other measures aimed at improving general energy efficiency. It is at the discretion of the Member States, possibly using voluntary agreements or other market-based measures, to ensure that energy distributors and retailers offer and promote energy services to their final customers or offer and promote energy audits and/or measures to improve energy efficiency or contribute to the financial instruments for improving energy efficiency. Qualification, certification and accreditation schemes for suppliers of energy services may also be put in place where Member States consider this necessary. Member States must also repeal or amend national legislative provisions and regulations which unnecessarily or disproportionately impede or restrict the use of financial instruments or other measures for making energy savings on the energy services market. Model contracts for financial instruments must be made available to interested parties.

Energy consumption for buildings-related services accounts for approximately one third of total EU energy consumption. With initiatives in this area, significant energy savings can be achieved. The European Performance of Buildings Directive (2002/91/EC) and its recast 2010/31/EU of 19 May 2010⁹⁹ (EPBD) lay down requirements as regards the common general framework for a methodology for calculating the integrated energy performance of buildings and building units, the application of minimum requirements to the energy performance of new buildings and new building units, and of minimum requirements to the energy performance of existing buildings, building units and building elements that are subject to major renovation, building elements and technical building systems whenever they are installed, replaced or upgraded. The EPBD also introduces requirements related to national plans for increasing the number of nearly zero- energy buildings, energy certification of buildings or building units, regular inspection of heating and air-conditioning systems in buildings, and independent control systems for energy performance certificates and inspection reports.

The CHP directive 2004/8/EC¹⁰⁰ establishes a common framework to promote and facilitate the installation of cogeneration plants where demand for useful heat exists or is anticipated. There are already examples of regulatory developments in some Member States, such as Belgium (green certificates and cogeneration quotas), Spain (a decree on the sale of cogeneration electricity) or Germany (a law on cogeneration). The Commission has established harmonized efficiency reference values for separate production of electricity and heat and will review these harmonized values for the first time on 21 February 2011, and every four years thereafter, to take account of technological developments and changes in the distribution of energy sources. Member States must ensure, on the basis of the harmonized efficiency reference values and within six months of their adoption that the origin of electricity produced from high-efficiency cogeneration can be guaranteed according to objective, transparent and non-discriminatory criteria laid down by each Member State.

⁹⁹ For more information visit: http://ec.europa.eu/energy/efficiency/buildings/buildings_en.htm

¹⁰⁰ Member states had to adopt the first obligations of the directive by 6 August 2007. For further information visit: www.energy.eu/directives/I_05220040221en00500060.pdf

Member States must analyze the national potential for the application of high-efficiency cogeneration. Member States or the competent bodies designated by the Member States must evaluate the existing legislative and regulatory framework with regard to authorization procedures.

The Eco-design directive (2009/125/EC) provides EU-wide rules for reducing the environmental impact of products, including energy consumption throughout their entire life cycle¹⁰¹. Apart from the user's behavior, there are two complementary ways of reducing the energy consumed by products: labelling to raise awareness of consumers on the real energy use in order to influence their buying decisions (such as labelling schemes for domestic appliances), and energy efficiency requirements imposed to products from the early stage on the design phase. Eco-design aims to improve the environmental performance of products throughout the life-cycle by systematic integration of environmental aspects at a very early stage in the product design. The directive does not introduce directly binding requirements for specific products, but does define conditions and criteria for setting requirements regarding environmentally relevant product characteristics (such as energy consumption) and allows them to be improved quickly and efficiently. It will be followed by implementing measures which will establish the eco-design requirements. In principle, the Directive applies to all energy using products (except vehicles for transport) and covers all energy sources. A set of regulations have already been enforced among others for household refrigeration appliances, electric motors, external power supplies and lighting products in the domestic and tertiary sector¹⁰².

The opinions about European policy as a driver differ. While some countries merely transpose the European legislation, others implement the spirit of the legislative acts, using them to establish ambitious action plans and implement concrete policy packages. Actors active on the Finnish market consider the Energy Services Directive together with the buildings certificates (EPBD) to be important ESCO market drivers. In addition, the function of the government to develop reference projects has an important value in creating legitimacy and lowering the perceived risk for projects.

The implementation of comprehensive national policy frameworks of complementary measures needs to be emphasised too: in Sweden the importance and profitability of energy efficiency measures has increased thanks to policies such as energy certification for buildings, the subsidy scheme for public building owners (KLIMP¹⁰³), and a set of market instruments (CO₂ taxes, green certificates, electricity tax for energy intensive companies (PFE), etc.). In France, the action plan "Le Grenelle de l'environnement" has created an ESCO market in the public sector with public-private-partnerships and private investments. In Slovenia, the recent decree setting limits on environmental pollution, the building and lighting legislation, the voluntary agreements of CO₂ taxes, the availability of structural funds (2009 tender), as well as

¹⁰¹ For more information visit: http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/index_en.htm

¹⁰² See full list of implementing regulations at http://ec.europa.eu/energy/efficiency/ecodesign/legislation_en.htm

¹⁰³ The Climate Investment Programme KLIMP supports municipalities and other local actors to receive grants (up to 30% of the investment) for long-term investments that reduce greenhouse gas emissions. Together, the programmes comprise about 900 measures and an investment volume of just over SEK 8 billion (Naturvårdsverket, 2010).

various financial incentives are expected to contribute to the ESCO market growth in the forthcoming years. In Italy, the growth of the ESCO market is strongly connected to the introduction of White Certificates. In 2009, 44% of the Energy Services Enterprises obtaining White Certificates declared to have the ESCO activity as their main business profile.

2. Structural and market related changes

The change in mindset towards the outsourcing of services such as energy management (e.g. Sweden and Czech Republic) and public building facilities management (e.g. Spain and Ireland) has increased the attractiveness of ESCOs.

In addition the refurbishment and modernisation needs (especially in the buildings sector) have increased the number of projects implemented by ESCOs. In Sweden, building owners show a growing preference to outsource operation and maintenance services. In the Czech Republic, the increased freedom in decision making of building and facility managers and owners together with the high operational costs and obsolete energy infrastructure have been important market drivers.

3. The steady rise in energy taxes

The energy price is one of the main factors influencing the demand of energy efficiency investments and therefore ESCO services. The steady rise in 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. For instance, in the Netherlands the introduction of substantial energy taxes raised the energy price for households and small companies, resulting in more profitable energy saving measures.

4. Competitive pressures

The effects of cost competition together with the need to improve cash flows and use off-balance sheet solutions for energy efficiency investments have been strong in most countries surveyed, most notably in Finland, Denmark, and Belgium.

5. Market liberalisation

The liberalisation of the energy markets has been underway since the last decade and is considered an important enabling factor in order to create the right market conditions for ESCOs to operate. The liberalisation of gas and electricity markets has transformed the semi-public energy sectors of some Member States into sectors with competing market oriented companies thus creating more room for value-added services.

6. Environmental awareness

The environmental awareness and climate change policies have had a spin-off effect with the implementation of favourable legislative frameworks and concrete implementing measures, as well as gaining political support. Several international programmes promote cooperation, technical assistance and financial aid for energy efficiency and conservation projects such as the Covenant of Mayors, the Clinton

Climate Initiative for Cities¹⁰⁴ and the (European Local ENergy Assistance) ELENA¹⁰⁵, among many others.

7. The establishment of an ESCO association

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.

The Belgian Federal authorities' energy service company and third party investor Fedesco and the newly established Belgian ESCO association Belesco facilitate energy performance contracting in the public sector. Fedesco is also creating a "Competence centre for energy services and financing of energy efficiency and renewable energy" and striving to establish a dedicated regulatory framework for ESCO projects in collaboration with Agoria.

The Swedish Energy Agency is pursuing a "portfolio of flexible mechanisms", including the formation of an ESCO network, customer oriented information, guidelines for the procurement process, model contracts, EU-IEE projects and project evaluations in order to spur energy performance contracting projects. In addition, the coordinated actions of a public authority disseminating information and advising potential project participants gives more legitimacy to the business model and to the energy performance contracting providers creating confidence on the market.

3.4. Recommendations for a further market development

A number of lessons can be drawn from the present analysis of the factors influencing the different market developments. The effect of the different factors is strongly dependent on the particular national circumstances and market maturity. This section points to important factors and actions that have had a positive impact in establishing and growing national ESCO markets.

1. Focused policy support and supportive policy frameworks

It is essential to have a sound legislative framework that enables ESCO type projects and policies and measures that promote energy efficiency investments. In order to promote ESCO projects in the public sector a number of important steps are necessary.

Firstly, adaptation of the public procurement laws in order to facilitate the evaluation of EPC providers and adapting the project cost evaluations in order to take into consideration lifecycle costs, including maintenance and energy costs. Secondly, update the procurement regulations by allowing group tendering by consortia and EPC providers to be evaluated on other grounds than previous EPC projects would facilitate the entrance of new and smaller actors in the market. Third, allow the inclusion of energy efficiency in technical tender specifications and use of lifecycle costing in public tender specifications. Clear, practical and ready-to-use guidelines on how to apply energy efficiency criteria in public procurement procedures are needed in order to improve the practical implementation of energy efficient public procurement. The availability of working tools such as internet based calculators, databases and handbooks, along with dissemination of information and training, would facilitate the implementation of new assessment criteria in the procurement

¹⁰⁴ For further information visit: www.clintonfoundation.org

¹⁰⁵ For further information visit: www.eib.org/products/technical_assistance/elena

process and base it on lifecycle cost assessment¹⁰⁶. Clearly allocated responsibility is needed in order to prevent overlaps and to ensure competence.

A favourable policy framework can shorten the payback time of energy efficiency investments and raise the awareness of energy efficiency measures, lowering investment risks. Certification, such as the energy performance certificates of buildings, is important in order to increase the demand for energy audits and monitoring requirements, facilitating energy saving estimations available through proper statistics and increase awareness. Improving the legal basis for the removal of specific barriers has been shown to affect the perceived risks of contractual arrangements. For example, in the Czech Republic the law supports the right of an ESCO to collect payment related to their customers' energy savings. In Hungary, local governments that have a contract with an ESCO can 'freeze' their energy costs in the budget. In contrast, in some countries the legal framework does not allow municipalities to retain the savings derived from implementing energy efficiency projects

Concerted effort is needed in order to legitimate the business model and to overcome real or perceived risk aversion through financial instruments. This could be achieved via loan guarantees by recognizing the contractual model and the establishment of or funding mechanisms, such as revolving funds that co-finance projects at lower interest rates.

The cases of Sweden and Austria show that energy agencies' active engagement in advising clients on energy services and in participating in pilot projects can have an important role in legitimizing the business model.

2. Project bundling

Successful project bundling strategies can help overcome many of the key barriers to financing of ESCO projects. To achieve sufficient scale, a strategy is required that allows for the aggregation of individual projects, technologies, service offers, and investments into a larger and more comprehensive lots, which could be interesting for ESCOs financial institutions. As demonstrated by the uptake of energy performance contracting in Germany and Austria, targeting public institutions and facilities for large-scale retrofit programmes can kick-start market activity.

Public-private partnerships are also encouraged. In Italy are public-private ESCO consortia developed where the public party is responsible for the aggregation of demand, for guaranteeing and implementing the energy saving measure(s), and for the compensation for the risk of financial losses. Energy saving becomes an instrument of aggregate finance. Typically local and regional commercial banks are ready to take part in such a consortium.

3. Accreditation and standardisation to build market confidence

The establishment of a national legal framework for the identification and the establishment of quality standards and certification schemes for ESCOS is essential in order to boost the ESCO markets and maintain confidence in them. The

¹⁰⁶ The European Commission has developed a Green Public Procurement Tool Kit which covers a number of practical issues for public purchasers. The kit includes training modules and concrete examples of environmental criteria which can be readily introduced in tender documents. This kit addresses, among others, products falling within the construction, transport, and electricity sectors. The Green Public Procurement Tool Kit is available on the following link:
http://ec.europa.eu/environment/gpp/toolkit_en.htm

standardisation of common core contractual provisions including clear frameworks, definitions, measurement and verification standards (such as the International Performance Measurement & Verification Protocol) and an accreditation system is essential in order to raise the confidence on the market.

4. Facilitating the access to appropriate forms of financing

The engagement of financial institutions is crucial for the establishment of a successful ESCO market. In immature ESCO markets public authorities or development financing institutions (DFIs) – including public banks – may need to promote customised financing products to respond to the specific barriers to energy efficiency financing present in each national market. For example, special purpose credit lines and/or revolving funds may be appropriate tools when there are liquidity constraints in the banking sector or the need to provide long-term credits to finance institutions. A guarantee scheme or other risk mitigating tools may be appropriate when the financing sector perceives that the risk of ESCO projects is too high. Where ESCOs' equity is insufficient to comply with the minimum equity requirement, a complementary instrument is needed, such as subordinated debt that can substitute and reduce the amount of senior debt and close an existing equity gap.

There is a wide range of instruments that can be employed and/or scaled up to promote the access of ESCOs to financing, including:

- Guarantee programmes that expand access to debt, thereby lowering the cost of financing and enabling more comprehensive energy efficiency project development;
- Special purpose credit lines or revolving funds to mitigate liquidity constraints in the banking sector and/or provide long-term credits to finance institutions and subordinated debt instruments to close an existing equity gap.
- Engaging development financial institutions (DFIs) – including public banks – as they are able to structure and competitively fund customized energy efficiency programs and financing initiatives;
- Expanding partnerships between financing sources and utilities, city agencies, and ESCOs, which have longstanding relationships with customers, to rapidly identify energy efficiency opportunities.

5. Establishing bankable ESCO project pipelines

Financing is not a panacea in itself and further enabling policies are needed. Ensuring mechanisms for project development and delivery is instrumental in generating a steady flow of investment ready projects. The range of further tools available for ensuring bankable ESCO project pipelines includes:

- Targeted communication about the profitability of energy efficiency investments;
- Programmes and technical assistance facilities that build the capacities of market participants to develop and structure finance for projects, most notably providing training for feasibility study and business plan preparation across a range of possible project proponents. These facilities can target both public authorities and private actors (such as ESCOs and SMEs) and can be channelled via appropriate local authorities or chambers of commerce.
- With a view to the need to create bankable project pipelines and the significant differences among Member States in terms of taxation and accounting regimes,

procurement, budgeting etc., there is a need to developing member states specific packages that can assist and guide project proponents – especially local authorities – through specific issues and procedures related to e.g. energy performance contracting and public procurement in their national context. This process can build on the outputs from various Intelligent Energy Europe (IEE) projects (EESI, Eurocontract, ClearSupport, Change Best, etc.). Such national packages can unleash a significant replication potential across local authorities once successfully implemented in one city/region. One communication channel for such an option can be the Covenant of Mayors.

- Further supplementary policies, such as energy audit mandates or monitoring of energy consumption of public entities and large private energy users with a possible commitment and/or incentive to implement economically feasible projects¹⁰⁷.

6. Establishment of an ESCO association and the collaboration with national energy agencies

An ESCO association can act as a reference point for ESCOs customers and suppliers and, by grouping and concentration of ESCO professionals, can represent the point of view of the industry with a unified voice. Two European ESCO associations, EFIEES¹⁰⁸ and EU-ESCO¹⁰⁹ are promoting the ESCO concept and acting as a reference point for its members.

In addition, the establishment of an association or a similar platform or forum could concentrate resources in information dissemination and capacity building. The association can create a support network for potential clients with capacity building, give direct advice, and access to information. The association could organize workshops and knowledge sharing events with ESCOs, potential clients (municipal representatives, facility managers, etc) and financial institutions in order to increase the knowledge of how ESCOs engage in projects and what benefits can ESCOs bring to project management from a risk reduction, financial and environmental perspective.

An ESCO association would also be a useful reference point for collaboration opportunities between ESCOs. The establishment of independent market experts) can provide confidence in the market and performs the function of a reference point for all stakeholders such as ESCOs, clients and decision makers.

Awareness-raising of the general public can be achieved by promoting energy performance contracts in public buildings.

¹⁰⁷ See the ESCO status reports 2005 and 2007 prepared by the JRC on deploying strategies to support the ESCO industry. A new status report is currently in preparation and is expected to be published in 2010.

¹⁰⁸ Available at: www.efiees.org

¹⁰⁹ Available at: www.eu-esc.org

4. Personal Communication and Acknowledgements

We would like to thank all those involved in writing this report. Benigna Boza-Kiss wrote the chapter on Hungary, Bogdan Atanasiu wrote the chapter on Romania, Damián Bornás Cayuela wrote the chapters on Portugal and Spain, and Patrizia Pistochini from ENEA collaborated in writing the chapter on Italy.

The authors of the present report would like to express their greatest gratitude to all persons who have kindly answered or reacted to our emails, phone calls or personal invitations to discuss about ESCOs across Europe. The experts, practitioners and professionals supplying direct information for the country reviews are listed below.

Albania:

- Alma Saraçi (Expert) 06/10/2009. Email correspondence

Austria

- Oskar Böck (Energy & Environmental Solutions Services, Siemens AG) September 28, 2009/ June 24, 2010. Email correspondence
- Monika Auer (DECA). November 04, 2009. Email correspondence
- Adam McCarthy (Johnsons Controls) October 16, 2009
- Márton Varga (e7 Energie Markt Analyse GmbH) March 15, 2010

Belgium

- Lieven Vanstraelen (Fedesco). October 17, 2009/ June 02, 2010. Email correspondence
- Swaans, Dirk (Honeywell Building Solutions). October 19, 2009
- Adam McCarthy (Johnsons Controls) October 16, 2009

Bosnia and Herzegovina:

- Samir Besirevic (IFC). October 14, 2009. Email correspondence

Bulgaria

- Dimitar Doukov (Bulgarian Energy Efficiency Fund). 16/10/2009. Email correspondence
- Zdravko Genchev (EnEffect). October 16, 2009. Email correspondence
- Zdravko Georgiev (Sofia Energy Agency – SOFENA). October 06, 2009. Email correspondence

Croatia

- Alexander M. Sharabaroff (World Bank). October 27, 2009. Email correspondence
- Vedran Uran (EETEK). October 02, 2009. Email correspondence
- Gordana Jeličić (HEP-ESCO d.o.o). October 16, 2009. Email correspondence
- Branimir Šteko (Za usluge u energetici d.o.o.). October 12, 2009. Email correspondence

Cyprus.

- Riza, E. (CRM Europe) October 22, 2009. Email correspondence

Czech Republic:

- Ivo Slavotínek (ENESA). October 06, 2009. Email correspondence

- Vladimira Henelova 8ENVIROS, s.r.o.). October 23, 2009. Email correspondence
- Michaela Valentova (SEVEN). October 02, 2009/ June 04, 2010. Email correspondence

Denmark:

- Johnnie R. Jensen (Danfoss Solutions A/S). November 04, 2009. Email correspondence
- Richard Schalburg (Dansk Energi/Danish Energy Association). October 19, 2009 Email correspondence
- Casper Kofod (Energy piano). October 27, 2009. Email correspondence
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence
- Peter Bach (Danish Energy Agency). June 07, 2010. Email correspondence

Finland:

- Seppo Silvonen (Motiva Oy). October 08, 2009. Email correspondence
- Eero Siitonen (YIT Industrial and Network Service Ltd). September 29, 2009. Email correspondence
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence
- Ulla Suomi (Motiva Oy). June 02, 2010. Email correspondence

France:

- Vollrad Kuhn (Clinton Climate Initiative - Energy Efficiency Building Retrofit Program). October 12, 2009. Email correspondence
- Patrick de Beaurepaire (FEDENE). October 20, 2009. Email correspondence
- Adam McCarthy (Johnsons Controls) October 16, 2009
- Patrick Jullian (Schneider Electric). September 28, 2009. Email correspondence
- Denis Givois (DAP Dalkia). May 31, 2010. Email correspondence

Germany

- Moritz Schäfer (Berliner Energieagentur GmbH). October 19, 2009. Email correspondence
- Vollrad Kuhn (Clinton Climate Initiative - Energy Efficiency Building Retrofit Program). October 12, 2009. Email correspondence
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence
- Wolfram Moritz (MPW Legal & Tax GbR). October 30, 2009. Email correspondence
- Friedrich Seefeldt (Prognos AG). October 19, 2009/ June 03, 2010. Email correspondence
- Nils Thamling (Berlin Energy Agency). June 03, 2010. Email correspondence

Greece:

- Haris Doukas (National Technical University of Athens). October 07, 2009/ June 25, 2010. Email correspondence
- Kostas Konstantinou (DEVELOPMENT AGENCY OF EASTERN THESSALONIKI). October 27, 2009. Email correspondence

Hungary:

- Sándor Antal (Director of the ESCO division, Dalkia). March 4, 2010. Email correspondence

- Enrique Grosser Lagos (Lagross Kft.). October 15, 2009. Personal communication and follow-up email correspondence
- Melinda Lipcsik (Energia Kozpont Kht.) November 12, 2009. Personal communication and follow-up email correspondence
- Dorottya Hujber, (Energia Kozpont Kht.) , November 12, 2009, Personal communication and follow-up email correspondence
- Botond Weores, EnergoBanking , October 26, 2009, Telephone communication (Dalkia), April 3, 2010. Email correspondence

Ireland:

- O'Hora Aideen (Sustainable Energy Ireland). November 06, 2009. Email correspondence

Italy:

- Albonico, V. (AGESI) 15-21 October 2009 and 28 December 2009. Email correspondence and personal communication
- Banchiero, A. (PIANETA). 21 October 2009. Email correspondence
- Cannata, M.I. (Cogenpower). 14 October 2009. Email correspondence
- Cayla, E. (SIRAM, Dalkia group), 21 October 2009. Email correspondence. 31 November 2009. Phone communication
- Di Lecce P. (Reverberi Enetec). 12 October 2009. Email correspondence
- Fiameri, C. (UNI). 19 November 2009. Email correspondence
- Fontana, E. (CariPrato). 20 January 2010. Phone interview
- Forni, D. (FIRE). 19 January 2010. Phone interview.
- Labanca, N. (eERG Politecnico di Milano's Expert). 15 October 2009. Email correspondence. 3 December 2009. Personal communication
- Pascucci, A. (Federesco). 28 September 2009. Email correspondence
- Piantoni, E. (Genergia). 16 October 2009. Email correspondence
- Savorana, F. (Expert). 17 October 2009, Email correspondence
- Tomaselli, A. (ASSOESCO). 2 October 2009. Phone interview. 21 December 2009. Email correspondence

Latvia:

- Claudio Rochas (Ekodoma, Ltd). October 23, 2009. Email correspondence

Lithuania:

- Lina Uzsilaityte (SE Energy Agency). October 16, 2009. Email correspondence

Netherlands:

- Ton Pruijsten (Essent Energiediensten BV). November 02, 2009. Email correspondence
- Paul Vethman (Energy research Centre of the Netherlands). November 02, 2009. Email correspondence

Norway:

- Thea Marie Mørk (NEE). October 19, 2009. Email correspondence
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence

Poland:

- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence
- Vollrad Kuhn (Clinton Climate Initiative - Energy Efficiency Building Retrofit Program). October 12, 2009. Email correspondence
- Janusz Mazur (Expert). October 14, 2009. Email correspondence

Portugal:

- Paula Fonseca (ISR). October 15, 2009. Email correspondence
- Ana Margarida Sanches (Energy Planning Specialist at Energias de Portugal, S.A.). November, 23 2009. Email correspondence

Romania:

- Corneliu Rotaru (Romanian Agency for Energy Conservation). October 20, 2009. Email correspondence
- Mihaela Coroiu (EnergoEco – EnergoBit Group). October 19, 2009. Email correspondence
- Catalin Dragostin (Energy-Serv). October 16, 2009. Email correspondence
- Mihai - Marius Voronca (Romanian Energy Efficiency Fund). October 19, 2009. Email correspondence

Russia:

- Pavel Teremetsky (EBRD). October 25, 2009. Email correspondence
- Pavel Svistunov (IMEBT) October 13, 2009. Email correspondence

Slovenia:

- Blaža Perpar (Eltec Mulej). October 28, 2009. Email correspondence
- Evald Kranjcevic (SLO Institute Stefan Jozef). November 03, 2009. Email correspondence

Spain:

- Margarita Puente (ESCAN, S.A.). October 20, 2009. Email correspondence
- Alejandra González Ruiz (Union Fenosa). October 23, 2009. Email correspondence
- Javier Siguenza (AMI) October 09, 2009. Email correspondence

Sweden:

- Malin Wigren (Schneider Electric). October, 2009. Email correspondence
- Jan Nygren (Vattenfall Power Consultant).16 oktober 2009. Email correspondence
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence

Switzerland:

- Mr. Christian Tinguely (Group E Fribourg). 20 November 2009. Phone interview
- Ronny Brunner (Director Swiss Contracting – CH). November 20th 2009. Phone interview
- Charles Weinmann (Responsible Swiss Contracting – Francophone CH). November 20th 2009. Phone interview
- Ullrich Brickmann (Siemens AG). October 20, 2009. Email correspondence

Turkey:

- Hakan Yildirim (SIEMENS SAN. ve TİC. A.Ş.). October 05, 2009. Email correspondence
- Vollrad Kuhn (Clinton Climate Initiative - Energy Efficiency Building Retrofit Program). October 12, 2009. Email correspondence

Ukraine:

- Vasiliy Stepanenko (Ecological Systems). October 26, 2009. Email correspondence
- Marek Tobiacek (Siemens Sp. z o.o.). October 21, 2009. Email correspondence

United Kingdom:

- Scott Petersen (Honeywell Building Solutions). November 18, 2009. Email correspondence
- Robert Jay (COFELY). October 05, 2009. Email correspondence
- Adam McCarthy (Johnsons Controls) October 16, 2009
- Vollrad Kuhn (Clinton Climate Initiative - Energy Efficiency Building Retrofit Program). October 12, 2009. Email correspondence

In addition, the authors would also like to thank those who have not given particular information but have directed us to the relevant people, or have hosted conferences and workshops which provided forums for information collection, or helped the publication of this report in any other way.

5. Appendices

5.1. Appendix 1: List of abbreviations

ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie; the French Environment and Energy Management Agency
AEEG	Autorità per l'Energia Elettrica e il Gas; The Italian Regulatory Authority for Electricity and Gas
AGESI	Associazione Imprese di Facility Management ed Energia; Association of Facility Management and Energy Services Companies
AMI	Asociación Espanola de Empresas de Mantenimiento Integral de Edificios, Infraestructuras e Industrias; Spanish Association of Enterprises of Complex Maintenance of Buildings, Infrastructures and Industries
ARCE	Agentia Romana pentru Conservarea Energiei; Romanian Energy Conservation Agency
ASSOESCO	Associanziaone Nazionale Societi Servizi Energetici
BiH	Bosnia and Herzegovina
CEM	Contract Energy Management
CHP	Combined-heat-and-power
CIS	Commonwealth of Independent States
CO ₂	Carbon-dioxide
DH	District heating
EBRD	European Bank for Reconstruction and Development
EESI	European Energy Service Initiative
EE	energy efficiency
EPBD EU	Directive on the Energy Performance of Buildings
EPC	Energy Performance Contracting
ESCO	Energy Service Company
ESP	Energy Saving Partnership
ESTA	Energy Services and Technology Association
E.V.A	Austrian Energy Agency
FG3E	La Fédération Française des Entreprises Gestionnaires de services aux Equipements, à l'Energie et à l'Environnement; French Federation of Companies Providing Services to Facilities, Energy and the Environmen
FOGIME	Crediting System in Favour of Energy Management
GEF	Global Environmental Fund
HUF	Hungarian forint
HVAC	Heating, Ventilation, and Air-Conditioning
IBRD	International Bank for Reconstruction and Development, see WB
IFI	international financial institution
KLIMP	Klimainvesteringsprogram
Ktoe	1000 tonne of oil equivalent

MNC	multinational company
MOTIVA	Finnish Energy Agency
PPP	Public-Private-Partnership
RES	renewable energy sources
SEE	South-East Europe
SME	small and medium sized enterprises
TPF	Third Party Financing
TACIS	European Union's technical assistance program
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VfW	Verband für Wärmelieferung, Association for Heat Supply

5.2. Appendix 2: ESCO Survey 2009



EUROPEAN COMMISSION

DIRECTORATE-GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Energy
Renewable Energy Unit

European ESCO Market Questionnaire

1. How many ESCOs¹¹⁰ are operating in your country?
2. Are they offering energy performance contracts (EPC) or other type of performance based contracts?
3. Which is the most common type of contracts used by ESCOs in your country?
 - a) guaranteed savings (ESCOs guarantee the energy savings, clients take the financial risk),
 - b) shared savings (ESCO and client share the savings),
 - c) build-own-operate-transfer (BOOT),
 - d) contract energy management (chauffage),
 - e) other (please, specify)
4. What is the typical size of an ESCO¹¹¹ in your country? Please, indicate the approximate market shares per category and the approximate number of ESCOs per category.
 - a) small (up to 50 employees) - ... % of energy service market, ... ESCOs,
 - b) medium (up to 250 employees) ... % of energy service market, ESCOs,
 - c) large (above 250 employees) ... % of energy service market, ESCOs,
5. Are ESCOs in your country local/national companies or part of large international corporations? Is energy service provision predominantly their core business or supplementary to other business activities (e.g. equipment manufacturing, energy supply, etc.)?
6. What types of ESCO companies are present in your country (e.g. building and control manufacturers, facility management and operation companies, consulting/engineering firms, and energy service & supply companies)?
7. What is the size of the ESCO market (total value of ESCO energy saving projects)?
8. What is the potential size of the ESCO market (total value of possible energy efficiency projects in the non-residential sector, with pay back time up to 10 years)?
9. In which sectors are the majority of ESCOs' projects:
 - a) Industry (process or horizontal technologies – motor systems)

¹¹⁰ For the definitions through the questionnaire please refer to <http://re.jrc.ec.europa.eu/energyefficiency/ESCO/index.htm>

¹¹¹ In case of large companies active in other sector than ESCO, the size refers to the ESCO division. I propose to delete 'parent company' because what if you know how big Siemens is in Germany – I guess the interest is only on the ESCO division, but disregard this if it is not the case.

- b) District heating
 - c) Co-generation
 - d) Street lighting
 - e) Private non-residential buildings
 - f) Public buildings
 - g) Renewables,
 - h) Other....
10. What are the most common barriers to ESCO projects:
 - a) Lack of appropriate forms of finance;
 - b) Mistrust from the clients;
 - c) Public procurement rules;
 - d) Small size of projects and high transaction costs;
 - e) Unstable costumers;
 - f) Others (please specify)?
 11. What are the typical sources of financing for ESCO projects: e.g. local commercial banks borrowing to ESCO or customer, ESCO own equity, client internal funds, state funds (e.g. revolving funds)?
 12. Has the 2008 financial crisis impacted ESCO projects? Has the 2008 financing crisis impacted financing for ESCO projects?
 13. In 2008 was the ESCO market growing or shrinking in comparison to the period 2005-2007? If growing, was it growing faster, slower, or about the same compared to the period 2005-2007? Why?
 14. Which are the existing driving factors for the growth of the ESCO market in your country?
 15. What, if any, EU or national programs or policies have promoted ESCO projects (e.g. white certificates, financial incentives, taxation, information and accreditation schemes, etc.)? How much public funding was available to support ESCO projects in 2008?
 16. Of the ESCO projects in 2007-2008 (both new projects and those currently in progress), what percentage of projects was:
 - a) Street or Indoor Lighting Only
 - b) Complex building projects involving more energy services (e.g. lighting and HVAC), complex refurbishments. Please, indicate if these were predominantly commercial, public, industrial or residential buildings.
 - c) Industrial sector involving more energy services
 - d) Co-generation or other supply-side projects.
 17. Do you have any other observations or comments related to the current status and recent developments of the ESCO market in your country?

6. References

- AEEG (the Italian Regulatory Authority for Electricity and Gas) (2008). *Terzo rapporto annuale sul meccanismo dei titoli di efficienza energetica. Situazione al 31 maggio 2008* (3rd annual report of the White Certificates at 31st May 2008). URL: http://www.autorita.energia.it/allegati/pubblicazioni/eeRapporto_08.pdf
- AEEG (the Italian Regulatory Authority for Electricity and Gas) (2009). *Il meccanismo dei Titoli di Efficienza Energetica dall'1° gennaio al 31 maggio 2009* (The mechanisms of the White Certificates, 1st Semester 2009). URL: <http://www.autorita.energia.it/allegati/pubblicazioni/1semTEE2009.pdf>
- AEEG (the Italian Regulatory Authority for Electricity and Gas). (2009). *Quarto rapporto annuale sul meccanismo dei titoli di efficienza energetica. Situazione al 31 maggio 2009* (4th annual report of the White Certificates up to 31st May 2009). URL: http://www.autorita.energia.it/allegati/pubblicazioni/eeRapporto_09.pdf
- Alliance to Save Energy (ASE). n.d.a. Countries: Serbia and Montenegro. URL: <http://www.ase.org/section/country/serbmont> [consulted 26/03/2010].
- ADEME (2009). *Energy efficiency in the European Union: overview of policies and good practices*. Building Club project Final Workshop, ADEME.
- Arturo Lorenzoni (2009). *Report RdS/2009/64. "Ricognizione normativa sui vincoli legislativi alla costituzione di una ESCo mista"* (Legislation reconnaissance on legal constraints to the establishment of an mixed ESCo), University of Padova. URL: http://www.enea.it/enea_paese/sistema_elettrico/Promozione_tecnologie/RSE64.pdf
- Berliner Energieagentur GmbH (2009) *Energy performance contracting – Hotspot Berlin as a national and international EPC role model*. Berlin.
- BEI/Prognos/energetic solutions (2009) (Bremer Energieinstitut, Prognos, energetic solution commissioned by BBR): *Contracting im Mietwohnungsbau* (Energy Services in Residential Sector). Forschungen Heft 141, Bonn 2009
- Caglar, M. 2006. Energy efficiency and financial availability for energy efficiency project in Turkey. Presentation at the JRC Workshop on End-Use Efficiency: "Financing of energy efficiency in New Member States, Acceding and Candidate Countries" Budapest, Hungary, 16-17 October 2006.
- Dalia Štreimikienė, Jolanta Bubelienė and Regina Glemžienė (2007) *Review of Instruments for Promotion of Energy Efficiency in Lithuania* in Environmental Research, Engineering and Management, 2007.No.1(39), P. 38-48
- Dansk Standard (2010). *Energi*. URL: <http://www.ds.dk/da-DK/ydelser/Standardisering/Fagomraader/Energi/Sider/default.aspx> [Retrieved 29/01/2010]

DATABANK. (2009). *Energy Service Companies*, COMPETITORS® Report. URL: <http://www.databank.it/prodotti/sommari/ZD9C.pdf>.

DI Energibranchen (2008). *Sælg resultater - ikke udstyr*. URL: <http://energi.di.dk/special/pages/go.aspx>.

Dupont, M. and Adnot, J (2004). *Investigation of actual energy efficiency content of "energy services" in France* in: Proceedings of International Conference on Improving Energy Efficiency in Commercial Buildings (IEECB'04), Frankfurt (Germany), 21-22 April 2004. Eds. Bertoldi, P. and Atanasiu, B. Ispra, Italy: European Commission, DG Joint Research Centre.

FIRE (2008). *Le ESCo in Italia (The ESCos in Italy)*. URL: www.fire-italia.it – Attività della FIRE - Indagini della FIRE

Databank (2009). *Competitors Report "Energy Service Company"*. URL: <http://www.databank.it/prodotti/sommari/ZD9C.pdf>

Energy Centre (2009). ESCO finanszírozási konstrukció fogalma, értelmezése, pénzügyi támogathatóságának alternatívái a Keop 4.0 és 5.0 prioritások keretei között [The concept and definition of ESCO construction and teh alternatives for its financial support under the EEOP priority 4.0 and 5.0]. Budapest, Hungary: Energy Centre.

Energy Service and Technology Association (ESTA) (2010) URL: <http://www.esta.org.uk> [Retrieved 15/05/2010]

European Commission, DG Joint Research Centre (EC DG JRC). 2005. *European Energy Service Companies Status Report 2005*. Authors: Bertoldi, P. and Rezessy, S. Ispra, Italy: EC DG JRC.

European Commission, DG Joint Research Centre (EC DG JRC). 2007. *Latest Development of Energy Service Service Companies across Europe*. A European ESCO Update. Authors: Bertoldi, P., Boza-Kiss B. and Rezessy, S. Ispra, Italy: EC DG JRC.

EU-Russia Energy Dialogue Technology Centre. 2004. *Renewable energy sources potential in the Russian Federation and available technologies*. Analytical Review for the workpackage #4 of the contract NNE5/2002/76. Main authors: Kargiev, V.M.; Lins, C.; Pinov, A.B.; Murugov, V.P.; and Sokolsky, A.K. URL: http://www.technologycentre.org/upload_files/Report_RE_English_.pdf

E.V.A (Austrian Energy Agency) (2010). *Country overview: Macedonia. Energy Policy, Legislative Background, Funds and Programmes*. URL: <http://www.enercee.net/macedonia/energy-policy.html> [Retrieved 29/03/2010]

Evans, M. (2000). Tapping the Potential for Energy Efficiency: The Role of ESCOs in the Czech Republic, Ukraine and Russia in: *Proceedings of the ACEEE 2000 Summer Study on Energy Efficiency in Buildings*, Pacific Grove, CA, August, 2000. Washington, D.C: American Council for an Energy Efficient Economy.

Golusin et al. (2010) *The analysis of the renewable energy production sector in Serbia*. Renewable and Sustainable Energy Reviews 14 (2010) 1477-1483.

Graz Energy Agency. (2003). *Thermoprofit: Marketing Performance Contracting*. Case Study Paper of IEA DSM Task IX.

Grim, M. (2006). The Austrian programme for private service buildings: ecofacility. In: *Proceedings of International Conference on Improving Energy Efficiency in Commercial Buildings (IEECB'06), Frankfurt (Germany), 26-27 April 2006*. Eds. Bertoldi, P. and Atanasiu, B. Ispra, Italy: European Commission, DG Joint Research Centre.

Hansen et al. (2009) *ESCOs around the World: Lessons Learned in 49*. The Fairmont Press. Lilburn, GA.

Improvement and Development Agency (I&DeA) (2010). URL: www.idea.gov.uk [Retrieved 15/05/2010]

Forsberg et al. (2007) *How to kick start a market for EPC. Lessons Learned from a mix of measures in Sweden*. Swedish Energy Agency; Eskilstuna, Sweden.

Labanca, N. (2010). Task 2.1: *Status and development of the energy efficiency service business in 18 EU countries*. URL: www.changebest.eu/index.php?option=com_content&view=article&id=7&Itemid=10&lang=en

London Development Agency (LDA) (2010) URL: <http://www.lda.gov.uk/server.php?show=ConWebDoc.3441> [Retrieved 15/05/2010]

Lindgren Soroye and Nilsson (2010) *Building a business to close the efficiency gap: the Swedish ESCO Experience*. Energy Efficiency, Springer Netherlands.

ManageEnergy (2010). URL: <http://www.managenergy.net/actors/A1130.htm> [Retrieved 7/03/2010]

Ministry of Economy, Energy and Tourism. Republic of Bulgaria (2010). *Energy Efficiency Act*. URL: <http://www.mi.government.bg/eng/norm/rdocs/mdoc.html?id=190688>.

Ministry of Energy and Natural Resources (2007). *ENERGY EFFICIENCY LAW*. Law No. 5627

Motiva Oy (2008) *Energy Efficiency Agreements 2008-2016*. Motiva Oy and Ministry of Employment and the Economy, Lonneberg.

Motiva Oy (2008). *Efficiency Agreement between the Ministry of Trade and Industry and the Municipality (Dnro 7202/804/2008)*. URL: www.motiva.fi/files/1444/Energy_Efficiency_Agreement_between_the_Ministry_of_Trade_and_Industry_and_the_Municipality.pdf

Murajda, T. (2005). Energy efficiency contract in district heating domain – Elementary schools in Petrzalka by C-TERM spol. s.r.o. In: *Proceedings of the Energy Efficiency Potential in Buildings, Barriers and Ways to Finance Projects in New Member States and Candidate Countries*. Tallin, Estonia July 2005. Eds: Paolo Bertoldi and Bogdan Atanasiu. Ispra, Italy: European Commission, DG Joint Research Centre.

MURE-Odyssee (2006). *Energy Efficiency Profile: Luxembourg*. URL: www.mure2.com [Retrieved 29.03.2010, 2010].

Operational Programme Environment (OPE) (2010). *About Operational Programme Environment*. URL: <http://en.opzp.cz/sekce/506/about-operational-programme-environment> [Retrieved 04/03/2010]

Prognos (2010) *Förderung von Energiedienstleistungsangeboten im Energiemarkt (Promotion of Energy Services in the Energy Market)*. Not published, commissioned by the BMWI, Berlin, 2010

National Strategy for Energy of Albania (NSE). 2005. Available in English at URL: Norsk Enok og Energi AS. 2005. *Country Overview- Norway*. EUROCONTRACT project.

Naturvardsverket (2010). *KLIMP*. URL: <http://www.naturvardsverket.se/en/In-English/Menu/Legislation-and-other-policy-instruments/Economic-instruments/Investment-Programmes/Climate-Investment-Programmes-Klimp/> [Retrieved 05/01/2010].

Rodics, G. (2005) *ESCOs in the Hungarian Energy Market*. In: *Proceedings of the Energy Efficiency Potential in Buildings, Barriers and Ways to Finance Projects in New Member States and Candidate Countries*. Tallin, Estonia July 2005. Eds: Paolo Bertoldi and Bogdan Atanasiu. Ispra, Italy: European Commission, DG Joint Research Centre.

Slovak Energy Agency (SEA). 2003. *Bankable Energy Efficiency Projects – BEEP National Report: Framework Conditions for Financing Energy Efficiency Projects in Slovakia*. SAVE project.

Seefeldt, F. (2003). Energy Performance Contracting – success in Austria and Germany – dead end for Europe? In: *Proceedings of the European Council for Energy Efficient Economy 2003 Summer Study*. European Council for an Energy-Efficient Economy, Stockholm

Sochor, Vladimír (2009) *COMBINING THERMAL INSULATION SUBSIDIES AND ENERGYSERVICES WITH A GUARANTEE*. News at Seven. ENERGY EFFICIENCY NEWS FROM THE CZECH REPUBLIC.

Teep, J. (2010) *Task 2.1: National Report on the Energy Efficiency Service Business in Estonia*. URL: www.changebest.eu/index.php?option=com_content&view=article&id=7&Itemid=10&lang=en

Bertini, I. and Morelli S. (2009). *Report RdS/2009/56. "Le Energy Service Company come strumento per la diffusione dell'efficienza energetica" (the ESCos as a mean to disseminate energy efficiency)*, University of Rome. URL: http://www.enea.it/enea_paese/sistema_elettrico/Promozione_tecnologie/RSE56.pdf

Zahradník, Petr (2009) *Insulation of building within the Green Light to Savings programme*. News at Seven. ENERGY EFFICINCY NEWS FROM THE CZECH REPUBLIC.

Zeman, J. and Dašek, B. (2005). ESCO in Czech Republic: projects, market, barrier. In: *Proceedings of the Energy Efficiency Potential in Buildings, Barriers and Ways to Finance Projects in New Member States and Candidate Countries. Tallin, Estonia July 2005*. Eds: Paolo Bertoldi and Bogdan Atanasiu. Ispra, Italy: European Commission, DG Joint Research Centre.

Žídek, O. (2005). Energy Performance Contracting in the Czech Republic - history, present and future development. Presentation at *ESCO Europe Conference 2005*. 4-5 October 2005, Vienna.

European Commission

EUR 24516 EN – Joint Research Centre – Institute for Energy

Title: Energy Service Companies Market in Europe - Status Report 2010

Author(s): Angelica Marino, Silvia Rezessy, Paolo Bertoldi

Luxembourg: Publications Office of the European Union

2010 – 109 pp. – 21 x 29,7 cm

EUR – Scientific and Technical Research series – ISSN 1018-5593

ISBN 978-92-79-16594-8

doi:10.2788/8693

Abstract

The present report is the 2007-2010 European ESCO status report, continuing the work of the "Latest Development of Energy Services Companies across Europe European" (Status Report 2007) published by the European Commission DG Joint Research Centre in 2007 and which covered the European ESCO market development during 2005-2007. The first ESCO report of this series is Energy Service Companies in Europe (Status Report 2005) published by the European Commission DG Joint Research Centre in 2005.

The aim of the present report is to update and to investigate the specific situation in every country in more detail. 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 development are investigated. Specific barriers are identified and potential interventions to increase energy efficiency investments and to exploit energy saving potentials through ESCOs across Europe are discussed.

How to obtain EU publications

Our priced publications are available from EU Bookshop (<http://bookshop.europa.eu>), where you can place an order with the sales agent of your choice.

The Publications Office has a worldwide network of sales agents. You can obtain their contact details by sending a fax to (352) 29 29-42758.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

