The European ESCO market: recent trends, market sizes, barriers and drivers and the remaining market potential

Benigna Boza-Kiss
GreenDependent Institute
Éva u. 4.
H-2100 Gödöllő
Hungary
benigna@greendependent.org

Paolo Bertoldi
European Commission, DG Joint Research Centre
Via E. Fermi 2749.
I-21027 Ispra (VA)
Italy
Paolo.Bertoldi@ec.europa.eu

Strahil Panev
European Commission, DG Joint Research Centre
Via E. Fermi 2749.
I-21027 Ispra (VA)
Italy
strahil.panev@ec.europa.eu

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Abstract

As part of the regular pan-European survey of Energy Service Companies (ESCOs) and their markets, a wide-scale experts-based market research was carried out by the European Commission, Joint Research Center in 2013.

The paper compares the key indicators and market specificities of the ESCO markets of the EU and its neighbouring countries, in particular related to the size of the markets, the number of actors and structural changes in the markets since 2010. The most important success factors and market barriers are explained with country-specific indications.

In general, a growing trend was observed throughout of the national ESCO markets of Europe between 2010 and 2013. The strongest growth was experienced in Denmark, France, Ireland and Spain, while Hungary appears to be the sole EU country affected by a clear decline. Development – where it happened – was noted in volume, complexity and/or maturity. ESCOs have also foraged in areas where they were inactive before. Nevertheless, the markets are far from reaching their potential.

As of today, the ESCO markets are driven as much by market forces (i.e. increasing energy costs, growing interest from potential clients, development of partnership between players), as by dedicated policy measures, regulations and financial solutions. Interestingly the list of drivers is similar in many countries, but the leveraging success factors and the leading barriers are diverse.

Introduction

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

In recent years the EU has increased the efforts to boost the European and national ESCO markets, in particular through Directives such as the Energy Services Directive (2006/32/EC) and the Energy Efficiency Directive (2012/27/EU), the EU EPC (Energy Performance Contract) campaign, dedicated financing for energy efficiency such as the European Energy Efficiency Fund (EEE–F), Intelligent Energy Europe (IEE) and research projects, such as Eurocontract, EMEEES, ChangeBest, Permanent, Transparense, EESI, EESI2020, Combines, etc.

The current paper depicts the status of the ESCO markets as of 2013 and looks at the changes since 2010, covering 43 European counties: the EU-28, Switzerland, Norway, the West Balkans, Turkey, Moldova, Belorussia, Russia, Ukraine, Armenia and Georgia.

Methodology

The lack of a common definition, clear and simple identification of ESCOs was regularly quoted as main barriers to the wider spread of the ESCO model in Europe, because it resulted in problems with trust and therefore a limitation in ESCO project demand (Marino et al. 2010). Definitions have been put forward lately by the EN 15900 standard in 2010, and later by the Energy Efficiency Directive (EED, 2012/27/EU) in 2012, which are meant to be used Europe-wide and as a consequence it has become somewhat easier to overcome problems with understanding and trusting the ESCO concept. In this paper and in the research underlying it, an ESCO has been identified as a natural or legal person that carries out energy performance improvement at the contractor's site, while guaranteeing energy savings and/or the provision of the same level of energy service at a lower cost. The remuneration of ESCOs is directly tied to the energy savings achieved. The ESCOs can finance, or assist in arranging financing for the project, but this is not a prerequisite.

The information in this paper is based on an online survey combined and complemented with personal and phone interviews. Using the snow-ball technique, interviewees were asked for further contacts who were then also contacted. Information was also collected from national reports, scientific articles, legal documents, and grey literature. After analysing the survey results, drafts were sent out to the same and further experts and business representatives, who provided valuable comments.

The field research was carried out mainly between December 2012–June 2013 (online survey), and during November–December 2013 (interviews and comments). Around 300 informative answers were received.

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

It is particularly difficult to compare numerical features, such as number of companies, size and potential of markets because local studies, if existent, focused on local need for information in the locally most appropriate and/or traditional form (yearly vs. cumulated values, market size in terms of containing construction costs/preparation/transaction costs/considering energy saving values, being expressed in terms of monetary value, energy savings, etc.). Available values are thus not freely comparable.

Overall development of the ESCO markets during 2010–2013

Most of the EU markets have grown since 2010, and only few of them remained stable[1] (Austria, Estonia, Finland, Luxembourg), some remained embryonic (Malta, Cyprus, Lithuania, Latvia) or declined (Hungary. maybe Sweden and the Netherlands). Of the non-EU countries 5–7 have experienced a small growth and 7 have not changed.

The growth has unfolded in size, referring to a larger number of companies/projects, as well as in strength reflected in market volume, more developed market structure, availability of institutions, or wider market coverage. The growth has been largely fuelled by the growth of demand, i.e. an expansion of interest from the side of potential clients (e.g. the public sectors in the Czech Republic, Denmark, the UK), who look forward to alternative financial and managerial solutions of energy renovations. In many countries dedicated European or national regulations have played important roles.

Country level data are presented in Table 1.

TYPES OF ESCO FIRMS

When markets have grown between 2010 and 2013, the new entrants have been mainly small engineering/construction firms (e.g. in France, Ireland, Slovenia, the UK) and/or utilities opening up their businesses towards energy services. These energy companies are either lead by regulations on energy efficiency obligations or DSM (e.g. Denmark, Latvia and Slovenia), or they offer energy services to attract new customers and increase loyalty of current ones (in Latvia, Austria, Denmark, Portugal). In Germany energy supply has been moving towards decentralised energy supply, and local and regional energy companies entered the energy services market in order to fulfil increasing interest from customers (MPW Institute LLC 2013).

In the non-EU neighbouring countries, small local engineering companies, construction firms are most common ESCOs, and the involvement of agencies and international donor supported special vehicle bodies is typical. These latter ones provide general support for the market (financing, training, lobbying, etc.), while also implement (pilot) projects. They are the equivalents of public ESCOs in European Member States. For example the Ukrainian and Moldovan markets were set up through these dedicated "ESCO agencies".

The number of public ESCOs has also increased in Europe. New public ESCOs participate in the markets of Switzerland and Croatia. Hungary and France are in the process of introducing a public ESCO. In Russia, FESCO was established in July 2011 under the supervision of the Ministry of Energy. There are several public ESCOs in Ukraine, the first one, UkrESCO, was established already in 1998. The public ESCO model used by Fedesco, Infrax and Eandis in Belgium has been referred to as an "integrating" organisation. They contract public entities (clients) directly, and then subcontract the tasks to smaller, private suppliers on a competitive basis.

It is interesting that Energy Performance Contracting (EPC)[2] is provided by different size of companies depending on the country. International large companies dominate the EPC market in Germany, Portugal, Belgium and mostly in Denmark and Sweden. However small companies can offer EPC in France, as

1. There was some level of disagreement amongst interviewed experts in the case of Austria, Sweden and the Netherlands, with some claiming a small growth, while others suggesting that a decline has taken place.

2. The central part of an EPC is energy rationalization on a guaranteed level, usually on the demand side, though may be on the supply side, or on both. The key features of an EPC include the transfer of technical risks from the client to the ESCO based on performance guarantees given by the ESCO. The ESCO's remuneration is strictly linked to the demonstrated performance.

Table 1. Country level data.

	number of ESCOs* in 2010	number of ESCOs* in 2013	market size* in 2010	market size* in 2013	market potential estimated in 2012–13*	market change since 2010**	developmental status***	ESCO association (establishment year if known)
EU								
Austria	over 50	over 50	n/a	€15–20 m	n/a	stable (or slowly decreasing)	good	yes (2005)
Belgium	10–15	10–15	n/a	€5 m	€500 million-several billion	slow growth	moderate	yes, two
Bulgaria	few	7–12	€6 million	€33 million (?)	€500–900 million	unchanged	preliminary	no
Croatia	2	10	€10 million	€100 million	n/a	slow growth	preliminary	no
Cyprus	0	0	n/a	0	n/a	unchanged	not existent	no
Czech Republic	8–10	20	€2–4 million	€10–20 million	€100–500 million	slow growth	good	yes (2011)
Denmark	10	15–20	€8–25 Million	€140–150 million	€1 billion	strong growth	moderate	no
Estonia	2	2 (3?)	n/a	n/a	€100 million (renovation of buildings)	unchanged	not existent	no
Finland	8	5–8	€4 million	€10 million	€200 million	unchanged	moderate	no
France	100	350	€4–5 billion	€75–100 m for EPC, €3.2 b/year for all	€250–500 m for EPC and €5 billion for all ESCO projects	strong growth	good	yes, several
Germany	250–500	500–550	€1,7–2,4 b/a	€3–4 billion, of which €150 million is EPC	€20–30 billion	slow growth	good	yes, several
Greece	2	5	n/a	0	€5 million	slow growth	preliminary	no
Hungary	30	10	n/a	n/a	n/a	strong decrease	preliminary	no
Ireland	15	ca. 30	n/a	n/a	n/a	strong growth	preliminary	no
Italy	100–150	50–100	€275 M in 2008; €387 M in 2009	€500 million	€1–10 billion	slow growth	moderate	yes, several
Latvia	5	8	€1–1.5 million	€2–3 million /year by one of the 7 ESCOs	€100 million–€10 billion	unchanged	preliminary	no
Lithuania	6	3–5	n/a	n/a	n/a	unchanged	preliminary	no
Luxembourg	3–4	3–6	0	0	€5.1–6.2 million	unchanged	preliminary/not existent	no
Malta	0	0	0	n/a	n/a	unchanged	not existent	no
Netherlands	50	50	n/a	n/a	€30 million/year	slow growth (or slow decrease)	preliminary	yes
Poland	3–10	30–50	€5–10 million/year (current value)	€10–25 million (2011) (annual turnover)	€25–75 million annually (economic potential)	slow growth	preliminary	no
Portugal	10–12	100	€10–30 million	n/a	€100–200 million	slow growth	preliminary	yes (2011)
Romania	14	15–20	ca. €50 million	n/a	n/a	slow growth	preliminary	yes (2013)
Slovakia	5	6–8		n/a	n/a	slow growth	preliminary	no (under discussion)
Slovenia	2–3	5–6	n/a	€3 million	€15 million	slow growth	preliminary	no
Spain	15	20–60	€100	€300–400 m/yr	€1.5–2-6 b	strong growth	preliminary	yes, several
Sweden	8		€60–80 million	€60–80 million	€300 million/yr	slow growth (or slow decrease)	preliminary	yes (2006)
United Kingdom	20	30–50	€400 million	n/a	n/a	balanced growth	good	yes

The table continues on next page. →

Table 1. Continuation.

	number of ESCOs* in 2010	number of ESCOs* in 2013	market size* in 2010	market size* in 2013	market potential estimated in 2012–13*	market change since 2010**	developmental status***	ESCO association (establishment year if known)
Other European countries								
Norway	5	10	€25 million	n/a	n/a	slow growth (but volatile)	preliminary	no
Switzerland	76 (7–10?)	6	€170–350 m/year (?)			slow growth	preliminary	yes
Southeastern Europe								
Albania	0	0	n/a	n/a	n/a	unchanged	not existent	no
BiH	n/a	5	n/a	n/a	n/a	slow growth	preliminary	no
FYR Macedonia	1	0	n/a	n/a	n/a	unchanged	not existent	no
Kosovo	0	0	n/a	n/a	n/a	unchanged	not existent	no
Montenegro	0	0	n/a	n/a	n/a	unchanged	not existent	no
Serbia	10	3–5	n/a	n/a	n/a	stagnation (or slow growth)	preliminary/not existent	no
Turkey		30 (?)	n/a	n/a	n/a	slow growth	preliminary	plans
Eastern Europe and Transcaucasia								
Armenia	n/a	11	n/a	n/a	n/a	slow growth	preliminary	yes (2006)
Belorussia	n/a		n/a	n/a	n/a	n/a	preliminary/moderate	no
Georgia	0	0	n/a	n/a	n/a	unchanged	not existent	no
Moldova	0	0	n/a	n/a	n/a	unchanged	not existent	no
Russia	n/a	up to 100	n/a	€100 million/year	€ 2.8–7 billion	slow growth (or slow decrease)	preliminary/moderate	no
Ukraine	n/a	ca. 30	n/a	€100 million/year	n/a	slow growth	preliminary/moderate	yes (1999, recreated 2013)

Notes:

* *These values are robust and originate from expert interviews and experts surveys based on precise definitions given during the communication. Nevertheless the comparison of country indicators should be tackled with care. Differences may be due to the interpretation of the ESCO company definition in the given context, while in the case of the market sizes, sources include different parts of the value chain and/or calculate or estimate these in a variety of ways.*

** *conclusion from experts' opinion, summarizing the changes between 2010 and 2013 primarily in the size of the market and the number of energy services suppliers.*

*** *conclusion from experts' opinion, summarizing the current status related to the size of the market, the number of energy services suppliers, the size of the demand and the level of institutionalisation of the market.*

(?): uncertain data, disagreement between experts.

opposed to the chauffage contracts[3] generally carried out by large firms.

ESCO projects may even be carried out by a community of residents and the local businesses. The Meadows Ozone Energy Services Limited (MOZES) replaces the traditional energy suppliers in the region of Nottingham, UK. The MOZES ESCO is responsible for financing, installing, operating and maintaining PV systems that supply the residents – who own the company – with renewable electricity via energy supply contracts (Hannon, Foxon, and Gale 2013). Similar idea has been advocated in Denmark by some municipalities (Jensen, Nielsen, and Hansen 2013), and the city of Gyor plans to transform their ESCO project (Raab-SOL) into a community lead district renovation, where the ESCO would be a facilitator rather than the implementer (Grosser Lagos 2013).

FACILITATORS AND ASSOCIATIONS

The role of facilitators has not been duly acknowledged in the development of ESCO markets (Bleyl et al. 2013). In a well-developed ESCO market, the buyers look for solutions to implement energy saving measures and/or property renovations and improvements. In this process they should consider the ESCO contract as an alternative to for example own implementation, leasing, outsourcing, etc. However, ESCO solutions are complex and are difficult to evaluate and compare – especially with alternatives. Most of the potential clients are not even aware of the existence of ESCOs. Bleyl et al. (2013) collected a list of tasks that facilitators can and do perform: among them, overall information, amplification of the use of the ESCO concept, help interested customers prepare a tender or other announcement, select the winner, conclude a contract, monitor, verify savings, etc. From the clients perspective all of these and other steps in procuring or contracting an ESCO is – to say the least – challenging. It requires specialized knowledge in technology, financing, management, even communication.

There are a number of organisations that act as facilitators, for example national (or local) energy agencies (e.g. Motiva in Finland, SEAI in Ireland, the Graz Energy Agency in Austria, the Berlin Energy Agency in Germany, the Cyprus Energy Agency in Cyprus, etc.), (private) energy audit companies, some legal advisors and private facilitators (e.g. the Swiss market is expected to be launched with their help), or the EPC procurement advisors in the Czech Republic.

In a few countries the government can take up this task, for example the Ministry for Energy and Natural Resources in Turkey. In the non-EU/EEA countries, International Financial Institutions (IFIs) can typically act as facilitators, e.g. the World Bank/GEF in Armenia, EBRD in the West Balkans. IFIs are also present in some EU countries, e.g. EBRD in Romania and Bulgaria. In these countries, agencies are set up by the government or external donors to stimulate the energy services markets, e.g. the Energy Efficiency and Cleaner Production Center in Georgia or the Moldovan Energy Efficiency Agency.

3. In a chauffage arrangement the fee for the services is normally calculated based on the client's existing energy bill minus a certain level of (monetary) savings, with a guarantee of the service provided. Alternatively, the customer may pay a rate, for instance, per square meter (Bertoldi and Rezessy 2005). The ESCO may also take over the purchase of fuel and electricity, depending on the particular agreements.

There are 11 EU Member States, Switzerland and Ukraine that are aided by one or more associations, about one quarter of which were established since 2010. Furthermore, in Slovakia, Slovenia, Sweden, the Netherlands, and Switzerland the establishment of further associations was on the table in 2013. There are several non-official organizations with similar functions, such as the ESCO Club in Poland, the Bulgarian WEC Committee, the ESCO network in Denmark, DEEM group in Hungary, the National ESCO Action Group in Ireland. Of the non-EU countries, Armenia has an ESCO association since 2006, Ukraine established an association in 1999, which stopped working after 5 years and was recreated in 2013, and there are plans in Turkey to establish one.

CONTRACT TYPES

The most commonly used contract type is still the chauffage contract. There are only a few countries, where EPC dominates, e.g. in Austria or the Czech Republic. Even in Germany, where EPC enjoys significant popularity as a result of the Berlin Energy Agency projects (Energy Saving Partnership model), only 8–10 % of the market is covered by EPC.

During the 2010–2013 period clarity has increased in regards to contracts, either because of the creation or the dissemination of standardized contract models or guides or because of the introduction of definitions/standards (e.g. standardized contracts in the RE:FIT programme in the UK, the EPC standard in Norway, certification and standards in Austria, etc.), or on the contrary more flexibility was allowed in the contracts or in the contracting process than before (e.g. Denmark, UK), and a so called "negotiated procedure" is followed (Belgium).

In parallel to existing contract types, new contract types emerged during the period under observation. In particular the new direction towards the so-called Integrated Energy Contracting (IEC) is promising, whereby demand side and supply side measures are combined under an EPC project, with demand side measures enjoying a priority. IEC contracts are simpler than normal EPC, and therefore less expensive. IEC has been developed for the German and Austrian markets, and is used in Greece and the Netherlands, too (Bleyl 2012; Wargert 2011).

TARGET SECTORS

ESCO projects are mostly implemented in the public sector (buildings and street lighting) and in industry, followed by commercial buildings. The preference depends on the national circumstances, the openness and willingness of the public administration, legal barriers, and on the industry side, factors such as size of the industrial sector and that of the individual installations, financial capacities, long-term thinking prevail.

It could be noted during the period 2010–2013 that sectors that were absolutely not attractive for ESCOs before, such as residential buildings and infrastructure (transport) were targeted by some projects. The problems related to these sectors include that they are decentralised and the projects tend to be small while experiencing higher transaction (information and face-to-face interaction) costs, the lack of trust from the potential clients is higher than in other sectors, potential clients have low liquidity and aversion to involve bank loans, and the split incentive problem is evident in most countries due to a high rate of renting, and the decision making process in multifamily buildings, etc.

The residential sector, public and private, has been given an increasing interest, in the form of pilots (e.g. the FRESH project in Italy, France and the UK, and the ESPARR project in Norway), but also in the form of ESCO-initiatives (e.g. in Denmark, Hungary, Estonia, France, Poland, Latvia, the Netherlands, Sweden, the UK, Germany and Switzerland). The Bulgarian government also expects energy savings through ESCOs in the residential sector according to their second NEEAP. These projects usually (but not always) combine some form of national or EU financial incentive with the ESCO technical project, therefore, a pure market based solution is not yet available. Nevertheless, the contracts are often guarantee based, i.e. the main role of the ESCO is to support the project with a guarantee.

SUCCESS FACTORS DURING THE PERIOD 2010–2013

There are a number of important drivers behind the above described market growth and transformation. The most important success factors are listed and explained below. In the period under observation, 2010–2013, it could be concluded clearly that a factor may be an important driver in the development of the ESCO market in one environment (e.g. the dedicated ESCO measures in Sweden), but may lead to only little change in others (e.g. in Spain the market is growing as a result of the supply side promotion rather than due to the mix of ESCO measures).

Legal and political drivers

Long-term, manifested and credible commitment by the public administration to sustainable energy, energy efficiency and/or directly to the ESCO concept is amongst the key factors that can kick-start a market. For example in Denmark, a strong energy efficiency regulatory framework has been linked with a pronounced commitment to the ESCO solution by local administrations. A vehicle of this message could be the NEEAPs, the SEAPs, or other official energy plans, strategies that do not depend on, for example, election cycles. Such a commitment ensures a safe business environment, and therefore longer-term thinking by both ESCOs and clients, and provides for lower transaction costs.

Strong energy (efficiency) policy framework is inevitable for the establishment and development of the ESCO market. When comparing the national markets, a general corroborative energy efficiency or sustainable energy regulatory background helps more than specific ESCO rules. For example, in the Netherlands ESCOs are not mentioned in legislation, nevertheless the general pro-efficiency policy framework ensures that the energy services market can operate with a growing success. On the other hand, there are markets where the market players do expect dedicated support or legal definitions, and where the generally energy efficiency friendly environment is/was not enough (e.g. Denmark, Norway, Latvia, Slovenia, etc.). Certification, transparency, information dissemination are amongst the functions stakeholders expect from dedicated legal acknowledgement or measures.

Dedicated ESCO legislation and measures have increased throughout Europe. While the ESCO Status Report 2010 (Marino et al. 2010) concluded that the number of policies and actions set up with the objective of directly supporting the ESCO market were limited, the opposite can be seen between 2010 and 2013. Around one third of the EU countries enjoy dedicated ESCO rules. The level of success of these measures varies widely, though. Successful package was introduced in Greece (the 3855/2010 law describes the context and principles of an EPC, provides a model contract and prescribes the allocation of obligations and responsibilities between the ESCO and the client). The Law on the Efficient Utilization of Energy in Final Consumption (adopted in 2008 and reviewed in 2012 OG 158/08 and OG 55/12) is the legal basis for energy services and ESCO operation in Croatia.

Complementing measures can also contribute to the success of ESCO markets. These are laws and regulations that are introduced for a reason other than supporting the ESCO market, but have a positive impact on energy services. The introduction of Energy efficiency obligation schemes (EEO) is mandatory in EU Member States via the Energy Efficiency Directive. The impact of EEOs on the ESCO market depends very much on its design. If energy companies (obligated parties) carry out energy services themselves, the system can be even competitive to market-based ESCO services. However, the system design may include the obligatory involvement of third parties, which will often be ESCOs. Similarly, the impact of White Certificates, especially if they are tradable it is more often seen as a driver, e.g. in Italy, Poland and sometimes in Flanders. Acquiring energy efficiency certificates through an ESCO implemented energy efficiency investment increases profits, thus increasing the demand for ESCO projects.

Removal of regulatory barriers was intentional in several ESCO markets. In Spain public procurement rules are adapted to long term (such as ESCO) contracts as a result of the procurement law (Law 30/2007, modified in Legislative Decree 3/2011). The contracting processes have been made dynamic and Article 11 of the Law defines the Public Private Collaboration Contract (PPCC) to suit best municipal conditions for ESCO projects. Energy-efficiency criteria were developed to be considered in the tendering process (Boonekamp and Vethman 2010). Similarly, the Swedish procurement act opens the way for EPC by accommodating it in public procurement practices.

ESCO and ESCO service standards are able to improve the quality of the markets, on one hand because of the clear requirements towards the suppliers and because the clients can more easily select trustful contractors. The European standard of energy services was introduced in 2010. There are a number of countries, which adopted their own official ESCO definition or a standard. For instance, in Italy Legislative Decree 115/2008 is the most relevant legislation for ESCOs, and it defines an ESCO, the energy service contract and energy service plus contracts.

Procedural factors, tools

Tools, models and handbooks have been produced that can be used at various stages of the project implementation. The EU has financed several projects addressing problems, such as project preparation, decision support, monitoring and verification, and even tools for the financing institutions interested in ESCO projects.

Standard documents have been advocated by a number of countries, where these have been prepared and used with more or less success. In 2011, after a few unsuccessful ESCO procurement projects, an ESCO procurement guide for the public sector was developed in 2012 in Finland (Koski 2011), which is expected to improve trust. EU projects also developed several model contracts.

A notable development and important brick to a trustful ESCO-client partnership is when there is **flexibility in the content and the preparatory procedure** of a contract. This allows tailored services to the needs of the client. In Denmark municipalities that consider entering an ESCO contract, but have not done so, often perceive risks as too high because many ESCO suppliers are unknown companies. This problem is overcome with a larger flexibility in the contracts, and municipalities may opt out at any time during the project timeline.

Established **statistics system, data collection, the introduction of centralized data collection and management systems** have been found to decrease transaction costs, and therefore increase the accessible profits for ESCO projects. The Myenergy programme in Luxemburg is one key driver of the ESCO market. The building certificates introduced by the EPBD have been often referred to as core drivers, for example in Sweden and Portugal. The certificates can be used as baseline information. In Turkey, ESCOs are the primary suppliers of energy certificates of buildings, through which they can acquire larger projects.

Financing

A number of **EU and national level grants, financial incentives, preferential loans** have been identified that were used during the period 2010-2013. In the Czech Republic ESCO projects have been regularly combined with EU Structural Funds Operational Programmes (CombinES project n.d.), which has proven effective and has increased the achievable savings from 20–30 % to 40–50 %. The EPC+ contracts in Latvia combine the ESCO contract model with state grants and forfeiting, to finance large scale renovations of multi-apartment buildings that are in particularly obsolete state (Government of Latvia 2011). While these national and local financial (especially the non-refundable) grants may be destructive to the ESCO markets (because they compete with market based instruments, e.g. in Bulgaria, Hungary, etc.), credit lines from IFIs and national governments have been seen as a key success factor in kick-starting ESCO markets. Currently, they are very common in non-EU countries.

Third Party Financing (TPF) has increased, but it is still used only in one out of 10 projects. Since preferential loans are not available in Germany, financing is provided by banks, which are particularly active in this country. The openness of the financial sector has increased in the Czech Republic.

Information and awareness

Motivation to refurbish sites, properties and buildings seems to increase. Energy efficiency investments are often driven by regular refurbishment. The experience of the municipalities that implement an ESCO project in Denmark shows that the measures are done quicker and at a cheaper price. Environmental and climate awareness has increased at all levels. This has motivated policies on the governmental levels, and participation in projects at the client sides. In Scandinavia, one of the main drivers of ESCO (and other energy efficiency) projects is public image and environmental concerns.

Awareness raising activities have boomed – all of the countries in the current report indicated running awareness raising and information dissemination activities between 2010 and 2013. This activity was multiplied with the implementation of the EU EPC campaign, which visited almost all EU countries. The ESCO concept is increasingly recognised by authorities and considered as a valid alternative to own investment, leasing and other traditional practices by clients. The knowledge and understanding of the various ESCO models is also growing. As a result, in several countries, promotion efforts are not wasted on explaining the general benefits of the model, but rather new contract forms and flexible conditions can serve the needs of the individual clients better.

The **Covenant of Mayors** has served as a key driver, and has been considered as one of the main success factors in the Netherlands, Denmark, Cyprus, Croatia, but also in non-EU countries, e.g. in Belarus, Ukraine, BiH, and Georgia. The CoM signatories commit to carrying out a number of energy efficiency improvement measures, which often include projects implemented by ESCOs.

Structural and market related changes

Energy price is one of the main factors influencing the demand of energy efficiency investments and therefore ESCO services. The steady rise in energy prices and energy taxes has improved the payback time of energy efficiency investments and increased the importance of energy efficiency in cost competition. The rise in energy prices has also increased the interest in energy conservation for non-energy intensive energy consumers. These can be combined with energy tax rebates (France and Italy) to further increase the profitability of ESCO projects. Similar measures are being considered in Moldova, Kosovo and Russia.

The **recovery of the construction industry** is currently a major driver and can be expected to contribute to an increase of ESCO projects both through the demand and the supply sides. In the Czech Republic less profitable types of measures (e.g. insulation) could be combined with profitable ESCO measures based on the increase of the construction activities and to reach deeper renovations. In the Netherlands, general renovations are extended to energy efficient refurbishment, too. In Denmark and Hungary, the decline of the construction sector has induced construction companies to search for new market niches, and thus enter the ESCO business.

The recent intensive proliferation of **ESCO associations** has meant a growing capacity to support the ESCO markets by awareness raising, representation, education, setting voluntary standards or even via directing projects to the member organisations. In addition other types of **facilitators** also appeared and intensified their activities. About 40 % of the EU ESCO markets enjoy the support of an association that is able to represent the companies.

In countries where projects and **project development processes** can be better tailored, and can be built up in a **step-by-step basis**, ESCOs have gained markets. Progressive projects are common in France, i.e. a client starts with a smaller project, and when trust has established, the client purchases the next service level or involves further buildings in the project. One successful project stimulates the contract for another. "Negotiated agreements" have been used in Belgium. After the tender is won by one company, projects are finalized through a "competitive dialogue".

Parallel **development of information and communication technology** was a driver in the Swedish ESCO market. The

boom of **smart technology**, used in the energy management of buildings is predicted to pull several ESCO markets along.

BARRIERS DURING THE PERIOD 2010–2013

The list of barriers has not changed significantly since 2010 throughout Europe, and all of the countries carry on to struggle with certain limiting factors. On the other hand, the observed growth and development is the result of successfully eliminating or decreasing one or more major barriers. The remaining most important barriers are discussed below.

Legal and political barriers

Unstable legislation can block ESCO markets. In an economy where laws change rapidly, without (proper) public and expert consultations and not allowing enough time for the business sector to prepare, long-term contracts, such as ESCO contracts are not viable, because of the high risks. Such unstable legislation has been a key barrier in the markets of Hungary, Slovenia, Italy, and Spain.

The **lack of official and/or generally accepted and known ESCO definition and/or certification scheme and/or standards** hinders the ESCO market. While there is an EU-wide definition for ESCOs, in many countries, it is the company that decides whether to refer to itself as ESCO or not. This has caused significant confusion in the Netherlands, Croatia and other West Balkan countries, where the notion of ESCO is popular, even if the company does not actually deal with energy services. On the other hand, in France, the number of ESCOs is underestimated because more general contracts often involve elements of ESCO services, however the whole contract is not an ESCO contract.

There are a number of examples of **contradicting interpretation of legislation** regarding the ESCO businesses. For example in Sweden, there is no common agreement whether a municipality-owned energy company is allowed to offer energy services outside their municipality of origin or not. Today, practice varies, and therefore some municipalities allow their companies to operate throughout the territory of Sweden while others restrict their activities to one municipality (SEA 2012). Public institutions in the Czech Republic are often afraid of using EPC because of the unclear rules (e.g. about project registration, approval and accounting). The lack of acceptance of the ESCO concept by the public financier is a crucial issue. In the Czech Republic, the so called "organisational units of the state" (OUS) are not able to apply EPC because they are legally bound not to receive or provide grants based on the Act no. 218/2000, Section 49. The Heat Supply Act does not allow selling services, i.e. comfort as a commodity in Slovakia.

Procurement related barriers used to be the central hurdles for ESCO projects. As of 2013, many of the national legislations have resolved the tendering and the public management of EPC projects. Nevertheless, problems do remain. There are still a lot of countries where the savings in energy costs cannot be transferred into another budget line, such as operation or human resources. There is a legal problem with the possibility to participate in tenders by all ESCOs. In several countries (e.g. Italy, Hungary, Sweden), a company that has carried out a feasibility study cannot participate in the competition for the renovation project. This is overcome only by "grey" solutions, e.g. the establishment of an extra company only for the preparation phase, etc. in Belgium, a solution has been found through the use of negotiated agreements (see at the drivers section). Procurement laws and practices are deemed as too complex in Cyprus, completely blocking the initiation of ESCO projects. But this problem is also evident in Croatia and Finland, even though procurement practices are also considered as drivers there.

Institutionalization and project tools

The **lack of facilitators** is considered as a market gap, i.e. without facilitators some ESCO markets cannot be started. For example, in Cyprus and Malta, neither the supply, nor the demand side has been able to push the market through its tipping point.

The **lack of proper measurement and verification practices** is a problem. Without a credible method to prove energy savings, projects can be debated by the participants. This has lead even to court cases (Latvia), or failed projects (Sweden). Measurement of projects where the public budget is also involved, because of a grant, is imperative. For example in the Czech Republic, the Kozloduy Fund does not use reliable measurement and verification system and therefore the appropriation of the financial grant can be debated. Similar situation has been in Hungary with the Panel Programmes and other building renovation programmes that required a certain level of energy performance improvement, but which was not checked or certified.

Financial barriers

Finding financing and finding appropriate financing solutions both remain to be common barriers. Although TPF is used more often than before, according to (EEVS 2013) only 1 out of 10 ESCO projects incorporates external financing. In the other cases, either the ESCO or the client will provide the budget for the project.

The most regularly referred problem relates to the **accounting of EPC projects as loans** by public authorities. This has two consequences. On one hand, municipalities and other authorities are not allowed by their government to participate in ESCO projects, because these are considered to fall under the **EUROSTAT methodology ESA 95** (European System of Integrated Economic Accounts), and therefore are added to the value of the government debts, which are limited by the EU legislation (Directive 2011/85/EU on requirements for budgetary frameworks of the Member States and related regulations). This is considered as a key barrier in Slovakia, Czech Republic, and Poland.

The other problem is that **liquidity** and **creditability** of the public administrations are limited, especially after the financial crisis. Therefore they are reluctant to take "loans", and/or banks are reluctant to offer loans to them.

The classic problems with banks remain, i.e. **low awareness and motivation of the financial institutions**. Nevertheless, there are a number of ESCO financial products, which are seriously underutilized. In Hungary, about 3–4 banks have ESCO-related products, which are not utilized because the application process has requirements which are either not possible to comply with (deadlines, list of administrative documents, etc.), or the costs and/or effort would be too high compared to the benefits of winning the loan.

There is a strong **aversion to loans** by potential ESCO clients, especially by the public administration, the private residential

and the private tertiary sectors. During the financial crisis, accessing loans was reduced and companies were afraid to get engaged with loans. They fear that the financial crisis situation can repeat, and loan repayment seems to them too risky. At the same time, banks are also much more careful in selecting the safer partners, and from their point of view an ESCO project is too risky, and thus unsafe.

High transaction costs remain to block the start-up of ESCO markets. ESCOs still prefer large projects, that have a better cost/benefit ratio. At the same time, pooling (or bundling) has gained more and more popularity, and is done in Austria, Germany, Luxembourg etc. In Denmark, an average of 60 buildings can be found in a pool. On the other hand, smaller ESCOs struggle to find the way in-between. In Sweden, clients prefer tenders for projects with a value of less than €56 million, in order to avoid the complicated EU level procurement.

If national financial grants are commonly used for energy efficiency renovations and the announcement of the grants and the volume of their budget is rhapsodic, clients will put their bankable projects on hold to wait to see if at least parts of the investments could be covered from the appearing grants. This is the case in Hungary and Latvia, where the risky legal environment and the incalculable financial support have had a major role in the decline of the ESCO market.

Market structure and partnership problems

There is still some **lack of trust by the clients** in the markets, although a lot has been done to overcome this barrier (see "drivers" above). Lack of trust usually originates from inhomogeneous ESCO offers in the market, lack of competition, lack of experience of clients, ESCOs and financial institutions, absence of credible and visible reference cases with a clear client focus, unclear definitions and failed contracts, and unstandardized measurements and verifications. Lack of trust is among the key barriers in the non-EU countries, and this problem is highly euphemized in the West Balkans and post-soviet countries, because of fear for corruption.

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

Failed projects have been seen to affect the markets very deeply. Even one critical project may undermine the successes in a short time. For examples in Sweden the ESCO market has decreased radically in 2009 due to an EPC procurement in Stockholm, where disagreement between the parties could not be resolved. The effects of this dispute were negative on other companies, too and created mistrust in the EPC business model, market recovery is slow since then. In Finland public procurement rules were not always followed properly, and the projects had to be stopped for investigation or be cancelled. In Latvia, a project was taken to court due to the disagreement about the results of the project. The same happened in Hungary and has contributed to a bad reputation for other companies, too, which have to restart market information campaigns and building up trust.

Conclusions

The key conclusions of the JRC ESCO status reports (Bertoldi, Boza-Kiss, and Rezessy 2007; Marino et al. 2011) were that the ESCO markets of the European countries vary widely in terms of development and size, as well as in features and frameworks. While this statement was still accurate on the whole in 2013, the markets have more in common than before.

First of all, most of the European markets have grown between 2010 and 2013, and only few of them remained stable or declined. The growth has unfolded in size, referring to a larger number of companies/projects, as well as in strength reflected in market volume, more developed market structure, availability of institutions, or wider market coverage. The growth has been largely fuelled by the growth of demand, i.e. an expansion of interest from the side of potential clients (e.g. the public sectors in the Czech Republic, Denmark, the UK), who look forward to alternative financial and managerial solutions of energy renovations. Nevertheless, there are countries where crucial regulatory drivers, information dissemination, financial solutions were introduced during the observed period (see section on drivers above). Interestingly, growth could be realised even in countries where the regulatory framework poses a problem for ESCOs (e.g. in Italy, Greece, the industrial segment of Slovakia, etc.).

In theory, the primary driver of an ESCO project is the future financial gain from the investment for both the customer and the ESCO. The client saves on energy costs, while the ESCO (and other contractors, financial players) raises profits. However, the focus of the ESCO contract shifts when it is concluded between a client and an energy service provider that is not doing the ESCO project for clear-cut profits. While we tend to consider ESCO projects as bankable on their own, it is increasingly common to engage in the field due to a mix of additional motivations, such as:

- improvement of image (since energy efficiency and climate change have a positive connotation);
- general renovation, which is then combined with the energy system revamping;
- improvement of comfort in the building or at the premises;
- triggering loyalty of customers and thus improving the position of core products;
- attracting more customers;
- complying with regulations.

If these motivations prevail, the ESCO-type investment can be cross-subsidised by the main product(s) of the contractor or from the client side, and can be added to the general renovation cost, for example.

By looking at the European ESCO markets, there are a number of common characteristics that describes a mature market. These are market features (several of) that are expected to appear or develop in currently underdeveloped markets if these are to expand. In order to achieve that, policies and/or public actions may be used to support one or more of these features.

- The ESCO concept is **known and understood**. Clients may need additional information about the specific offer and contract types offered by suppliers, but a decision between

own investment, ESCO project, outsourcing, etc. is done internally by the client;

- The market is **demand driven**, meaning that (potential) ESCO clients actively search for suppliers, and define their needs and requirements for an energy services project or package, announcing them and waiting for alternative solutions, which can be compared to each other;
- There are **alternative contract forms**, several of them available in a standard format or supported with guidebook that were prepared by independent organisations but with the involvement of market stakeholders;
- There are **alternative financial solutions**, including client-financing, bank involvement;
- **Transaction costs are low**;
- There are **facilitators**, who can help clients decide about the available offers, while they can help the supplier side, too, by lobbying, general promotion, training, certification, etc.;
- The **policy framework does not hinder** the ESCO projects, nevertheless there is no need for dedicated "ESCO laws";
- **Grants or preferential loans** – if available – **do not favour, nor disqualify ESCOs**. They should be **gradual** and provide non-refundable subsidies only for measures that have a very long payback time, but are socially beneficial, and that are combined with more attractive measures in order to achieve e.g. deep retrofit or complex project or favour special social groups, etc.
- **There is a guarantee fund**.

The above criteria are not universal by any means. A certain market may need to fulfil only part of the points and/or may have one or more key features. It is also not an aim or a politically arguable aim to strive for a "theoretically" developed ESCO market actively – a lot of times, markets will decide for themselves and/or the frameworks will distort the value of the ESCO business.

Abbreviations

b	billion
EPC	Energy Performance Contract/Contracting
ESCO	Energy Service Company
m	million
n/a	no data or no information available
NEEAP	National Energy Efficiency Action Plan
SEAP	Sustainable Energy Action Plan
TPF	Third Party Financing

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