THE HANDIHEAT PROJECT

An overview of ESCOs concept and the global market trend

HANDIHEAT
Northern Periphery and Arctic Programme
EUROPEAN UNION
Investing in your future
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1. EXECUTIVE SUMMARY

This report gives an overview of the energy service companies (ESCOs). The concept of ESCOs and the different types of energy service contract models (i.e., energy performance contracting - EPC and energy supply contracting - EPC) are explained in detail. The report also shed light on the global ESCO market. The countries with the highest ESCO market penetration are highlighted and compared to the regions where ESCO markets are less or underdeveloped or facing a halt. This comparison helps to understand the existing barriers to the uptake of the ESCO market.

Some barriers were found to be the same for most of the countries facing troubles for the development of an ESCO market. The key findings like the absence of the key policy support and enforcement mechanism and lack of techno-economical awareness on customer end are encountered as main barriers.

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2. ABBREVIATIONS

ESCOs	Energy Service Companies
ECMs	Energy Conservation Measures
ESPC	Energy Savings Performance Contract
EED	Energy Efficiency Directive
EPC	Energy Performance Contracting
ESC	Energy Supply Contracting
M&V	Measurement and Verification
USD	US Dollar
US DOE	United States – Department of Energy
FEMP	Federal Energy Management Program
EU	European Union
NPV	Net Present Value
ROI	Return on Investment
ETS	Energy Trading System

3. INTRODUCTION

In recent years there has been an increased interest in the provision of energy services to achieve energy and environmental goals. Some new companies providing energy services to final energy users, including the supply and installations of energy-efficient equipment, and/or the building refurbishment, have started to operate on the European market.

What differentiates these companies, defined as Energy Service Companies (ESCOs) from conventional energy consultants or energy equipment suppliers lies in the fact that they can also finance or arrange to finance for the operation and their remuneration is directly linked to the energy savings achieved.

4. WHAT ARE ESCOs?

An energy service company (ESCO) is a business that provides a broad range of energy solutions including designs and implementation of energy savings projects, retrofitting, reduce energy costs, and decrease in operations and maintenance costs. In general, ESCOs act as a project developing the body for a comprehensive range of energy conservation measures (ECMs) and assume the technical and performance risks associated with a project.

ESCOs are distinguished from other firms that offer energy-efficiency improvements in a sense that they use the performance-based contracting methodology. When an ESCO implements a project, the company's compensation is directly linked to the actual energy cost savings. The basic understanding of an ESCO project is presented in Figure 1, where different phases of an ESCO project are displayed.

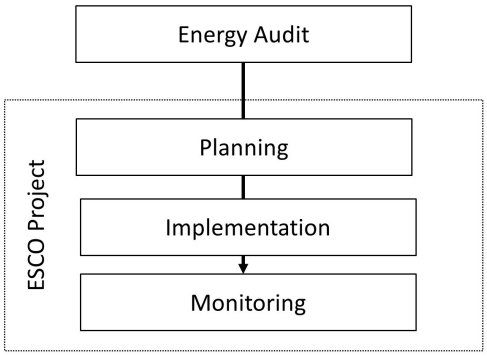

Figure 1: Different phases of a typical ESCO project [1]

The substantial energy-efficiency retrofits and renewable energy technologies inherent in ESPC (energy savings performance contract) projects typically require a large initial capital investment and may have a relatively long payback period. [2]

4.1. Key players

There are three main key players in an ESCO project [3]:

Beneficiary/End-User:

The beneficiary/client (the property owner) is always the one receiving and benefiting from the energy services provided. The contract can involve a wide range of customers, from the private sector to the public sector, from individual homeowners to industrial sites, commercial buildings, or a whole municipality.

Energy service company:

The energy service company is responsible for the various activities during the evolution and post-completion of the project. The wide range of the activities are stated as follow [4]:

- Energy audits and analysis
- Energy management
- Design of the project and its implementation
- Project operation and maintenance
- Savings evolution and monitoring
- Facility management
- Equipment and energy (fuel) supply
- Provision of service (space heating, lighting, etc.)

Finance provider:

The body responsible for the project finance can be a third-party financial institution (e.g., a commercial or development bank), in some cases the client itself (e.g., large real estate companies), or the ESCO. In the binding contract, the financier is linked to the project cash flows, who often takes on operational risks depending on the contract specifics.

5. UNDERSTANDING OF ESCOs UNDER ENERGY EFFICIENCY DIRECTIVE

The EU member states and the EU commission felt the need for a common definition of energy service companies (ESCOs) and the different types of contracts that they offer. This was also needed to allow for new possibilities for international marketing of the services and to share experiences in allowing the ESCO industry to take a larger role in energy efficiency implementation and financing.

Different aspects of ESCOs under the energy efficiency directive (2012/27/EU, "EED") [5] are listed below.

5.1. Energy Service

Energy service means the physical benefit, good delivered, or utility from a combination of energy with energy-efficient action or technology. This energy service may include operations, maintenance, and control required to deliver the service. The service is delivered based on a contract and in normal circumstances has proven to result in verifiable and measurable primary energy savings or energy efficiency improvement.

5.2. Energy Service Provider (ESP)

An energy service provider is a term for a legal body that delivers energy services and/or energy efficiency improvement retrofits/measures in a final customer's facility.

5.3. Energy contracting models

An ESCO can provide two main contracts models for energy services:

5.3.1. Energy supply contracting (ESC):

Energy supply contracting (ESC) means a long-term contractual agreement between the client and an ESCO to reduce the energy bill of the client. The ESCO may install more efficient equipment, employ more affordable fuels or implement solutions to achieve the savings.

Under an ESC model, an ESCO is only remunerated for the useful energy output, i.e., it supplies useful energy, such as electricity, heat, or steam under a long-term contract to a building owner or building user. It is therefore in the interest of the ESCO to reduce the final energy demand. The output is measured and verified in Megawatt-hours delivered. ESC models run under long-term contracts of typically ten to fifteen years, depending on the technical lifetime of the equipment deployed.

5.3.2. Energy performance contracting (EPC):

Energy performance contracting (EPC) means a contract-based arrangement between the client and the provider of an energy efficiency improvement measure. The energy management system is verified and monitored by the provider during the whole term of the contract. In an EPC settlement, investments are paid for concerning a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings. The costs and expected relative savings are shown in Figure 2.

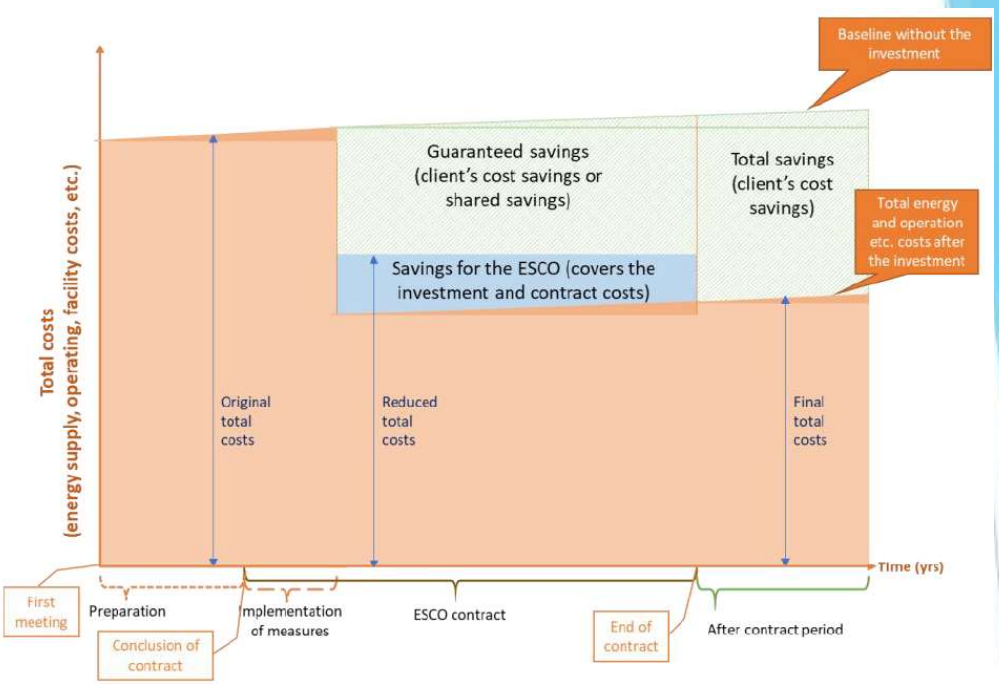

Figure 2: Energy performance contracting scheme. The expected costs and relative savings. [6]

The costs assumed by the client before the ESCO project include the supply of energy, operation, facility management, and other running costs. The project planning is the first step and it is based on feasibility studies and data collection, baseline measurements, identification of measures, and several meetings and consultations (Figure 3). This period can take up to 1-2 years. After concluding the contract, measurement implementation takes place, which is often shorter than the preparation but depends on the size of the facility or site and on the types of measures to be implemented.

Figure 3: An EPC project's supply chain [7]

The EPC contract may be focused on the energy-saving investments only, in which case operation remains in the hands of the client, but it is more typical that a service package is included with maintenance, operations, provision of energy services, etc. During this period the running costs have lowered, and the savings are split between the client and the ESCO.

This creates incentives for the client to undergo the EPC project and allows the ESCO to recover its investment costs, the transaction costs and the service costs. At the end of the project, the ownership of the new equipment is taken over by the client, and all cost savings are also retained by the client (Figure 3).

In short, EPC is an agreement between the ESCO and the client on the share of the energy savings and its inherent risks as a result of the implementation of energy efficiency measures.

Thus, in the case of ESC, the service simply provides power to the customer, while the EPC offers a more complex and complete service since it covers both the optimization of energy supply and increases the energy efficiency in the client's facilities. Therefore, the EPC option offers a high potential for savings.

There are three types of EPC contracts:

- Shared savings
- Guaranteed savings
- Mixed savings

In a **shared savings contract**, the investment is assumed entirely by the ESCO, including investment financing, management, and control of energy consumption (Figure 4). This mechanism is attractive for the ESCO as long as it excludes penalties if the implemented measures perform poorly or the initial estimation proves to be too low.

In return for providing financing, the ESCO undertakes comprehensive management. To compensate for the managerial complexity involved, the ESCO typically prefers large or medium-sized customers. Usually, there is a fixed payment for investment amortization, a maintenance fee, and a variable payment based on the savings achieved.

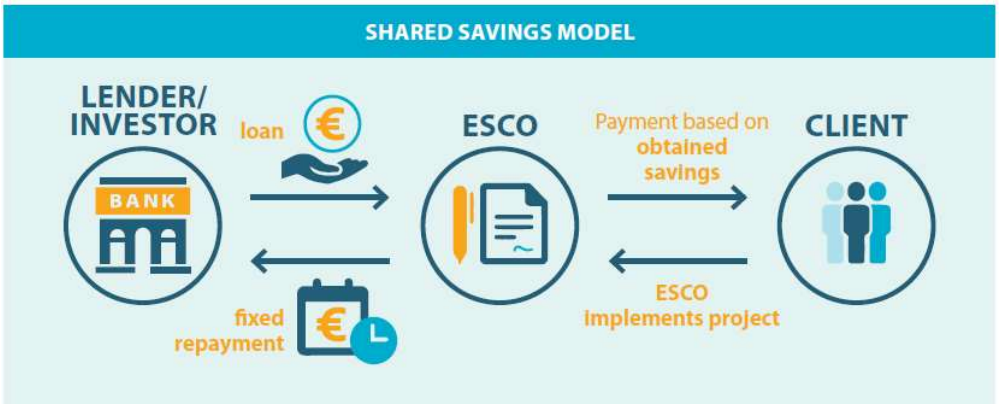

Figure 4: Shared saving model [3]

In a **guaranteed savings contract**, the client undertakes the entire investment required (Figure 5). In this case, the ESCO shall ensure real savings and if they are not enough to cover debt service, then ESCO might pay the difference. If the savings exceed the guaranteed level, then the customer must pay an agreed-upon percentage of the savings to the ESCO.

Figure 5: Guaranteed savings model [3]

This mechanism is typically used when the investment associated with the project is assumed by the client. This is why this type of contract is only suited for clients with sufficient finances, typically large or medium-sized companies.

Mixed savings kind of contracting is a highbred combination of the two previous models. The ESCO guarantees savings to the client with any additional savings shared between the ESCO and the client.

5.3.3. Active energy performance contracting

Active energy performance contracts (Active-EPCs) are an emerging form of energy performance contracting. These incorporate demand response into the contracting process, whereas a traditional EPC does not account for such flexibility. [3]

Active-EPCs enable adjusting use or flexibility in operation processes (e.g., running appliances at off-peak hours) or onsite energy production to further energy and cost savings. The process can be manual or automatic and is aided by smart meters and energy management systems. Active-EPCs provide benefits on a scale beyond just the end-user, such as reduced investment in peak generation, reduced emissions, and providing transparency in energy usage figures.

5.4. Energy supply contracting (ESC)

Energy supply contracting (ESC) means a long-term contractual agreement between the client and an ESCO to reduce the energy bill of the client. The ESCO may install more efficient equipment, employ more affordable fuels or implement solutions to achieve the savings. ESC includes reduction of supply costs, whereas EPCs generally focus on demand-side reductions (Figure 6).

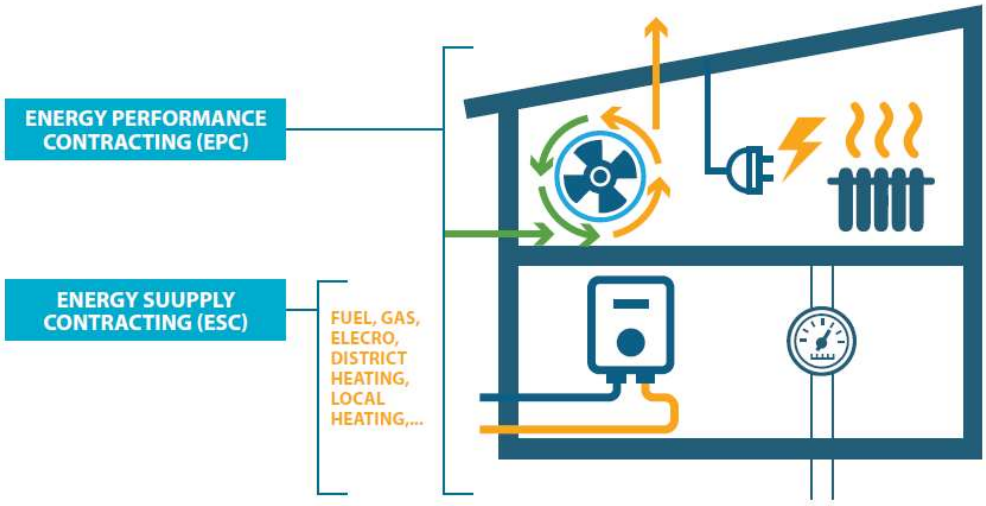

Figure 6: EPC (Energy performance contracting) vs. ESC (Energy supply contracting) [3]

The ESC business model includes all components of the energy services, from upgrades to the purchasing and delivery of fuel. This form of contract is most common for heating and cooling services (combined heat and power – CHP) and renewable energy projects. The advantages of energy supply contracting are optimized operating costs and security of energy supply, in addition to energy savings on the supply side. A holistic overview for EPC and ESC contract types is given in Table 1.

Table 1: Characteristics comparison of EPC (shared & guaranteed) and ESC. [8], [6], [3]

	EPC – Guaranteed savings	EPC – Shared savings	Energy supply contracting (ESC)
Key elements	Energy saving measures with ongoing monitoring and verification services to provide guaranteed energy savings. **'Saved Energy' based concept.**	Energy savings measures (mainly demand side) to provide cost savings associated with the overall energy/utility bill. **'Saved Energy cost' based concept.**	Efficient energy supply (heat, electricity, etc.) is contracted, measured, and delivered. Low or no priority to the saved energy and related cost. It is limited to the supply side (boilers, chillers, etc.) without taking demand-side equipment into account.
ESCO Guarantees	Yes. The ESCO guarantees the performance based on the level of energy saved throughout the contract.	Generally, not. However, the ESCO may guarantee a minimum performance based on the cost of energy saved throughout the contract life.	No guarantees attached. ESC may include incentives based on energy use reduction on the supply side, but without assuming any penalties/risk if the expected efficiency improvement is not reached.
Payment	Payments are derived from energy savings achieved at constant prices of the base year.	Payments are linked to the achieved change in energy expenses.	Payment based on a fixed rate/tariff, generally without performance requirements.
Risks	ESCO assumes technical design, implementation, and performance guarantee risks. Demands established banking structure because customers are responsible for the credit risk).	ESCO assumes performance risk, risk of energy price change, and customer credit risk.	No risk assumed by the provider.
Transparency	High level of transparency. The energy consumption is measured before and after the measures are implemented. The transparency depends directly on the quality of measurement & verification (M&V).	Varied transparency. Depends on whether and what quality M&V is provided. ESCO assumes performance risk, risk of energy price change (depends on current prices), and customer credit risk.	Low or no transparency. A specific bill reduction is established (in monetary, not physical units). Typically, the contract does consider the measurement of energy efficiency.

6. GLOBAL ESCO MARKET

The ESCO market size can be analysed based on the energy performance contracts, contract size and the overall market revenue. ESCO market size calculation varies between different regions around the globe. The global ESCO market grew from 28.6 billion USD in 2017 to 30.9 billion USD in 2018 [9]. As China continues to dominate the global ESCO market with 16.4 billion USD (Figure 7), there have been serious government incentives and policies put together to facilitate ESCO market growth. These incentives include tax incentives and dedicated funds for ESCOs. Anyhow, as per new policies, these measures have recently been removed to allow the ESO market to operate independently. This will test market functionality without such government interventions.

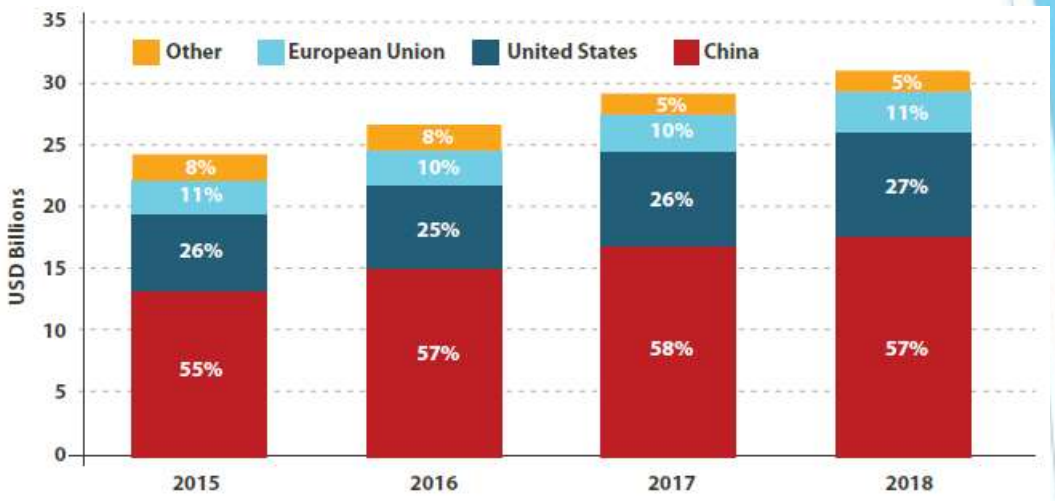

Figure 7: Global ESCO market (revenue) growth (2015 – 2018) [9]

US ESCO market is recorded in 2018 at 8.3 billion USD, 85% of which is in the public sector [3]. Government contracting for many projects in municipalities, universities, schools, and hospitals has long driven the US market. Several national support measures are in place to provide assistance, training, legal advice, and model contracts for federal EPC projects; e.g., the US Department of Energy (US DOE) and the Federal Energy Management Program (FEMP).

The European (EU) total market value has grown from 2.7 billion USD (2015) to 3 billion USD (2018) [3]. However, the EU ESCO market has not experienced the market expansion as the US or China have experienced, as these markets have strong public sector engagement and financial support with local and national governments pushing EPCs. The majority of ESCO projects like the US in Europe are in the public sector for non-residential building projects e.g., government buildings, schools, hospitals, etc.

Within the EU, since 2015, there have been signs of growth in ESCOs and the strongest ESCO market growth has been seen in Belgium, Croatia, Denmark, Slovenia and Italy. However, in Denmark, the market has shown signs of slowing down compared to previous years, because the previously wide-spread public building renovation sector has largely saturated. Slovenia and Croatia saw the growth driven by government investment in the form of grants. The picture across the EU varies greatly, as does the picture within the Northern Periphery and Arctic Area itself.

In some larger EU countries like Germany and France, energy supply contracting (ESC) has a relatively high market share. For example, big energy providers with large cash flows for over 60 years have provided the French “chauffage” contract (energy supply contracting). [8] The energy companies have developed highly standardized contracts to implement chauffage contracts, which makes it easier to involve in such contracting. ESC accounts for 85% of the energy-saving contracting market in Germany. The German market is driven by the public sector and it is well suited for ESC since it has a largely decentralized heating system and the government promotes CHP [8].

The UK has had an energy services market since the 1960s based on the “contract energy management model” and this model is still the one most used today. According to a Navigant Research estimation, the total annual energy efficiency service market in the United Kingdom was £349 million in 2017 (Navigant Research 2017) cited in (BEIS 2018). The UK non-domestic energy efficiency market size, taking into account the total volume of public sector energy service contracts (capital projects), is estimated to be £161 million per year (BEIS 2018). QualitEE project survey estimated the market size for EPC to be EUR 108.3 million (QualitEE 2018l).

Successful ESCOs have been established in the UK, with one of the most well know being that in Nottingham, the Robin Hood Energy LTD Not for Profit organisation. Robin Hood LTD is responsible for more than one energy project including Enviroenergy and Gas and Power. Enviroenergy is built around a combined heat and power scheme providing up to 11.4 MW of power through a private wire network and 120,000 MWh annual thermal output via heat from waste to over 4900 domestic customers (3000 in social housing units) with 70% of heat units sold to commercial clients.

A range of revenue opportunities were developed out of this ESCO including the sale of non-domestic heat and non-domestic power, domestic heat, the sale of Renewables Obligations Certificates (limited to 20 years from commissioning) and energy export of surplus energy to the grid, among others. These revenues have led to the project paying back the initial development costs and now the council receives a surplus from the project. This can be used in a range of ways to help the community – lower prices for the social units, re-invested in educational initiatives teaching energy efficiency, general investment in the community etc.

More could be done to promote the success of these projects and raise awareness across the regions allowing potential clients to follow any best practice from successful projects.

The Finnish ESCO market is considered to be close to mature. The total value of subsidized ESCO projects in Finland was EUR 6,5 million (8 projects). The ESCO market has experienced a slow increase since 2015. Several new ESCOs entered into the market over the years between 2015-2020.

This development has been led by Motiva’s energy programme of which the promotion of energy services is a significant part. Motiva lists 15 ESCOs on its website made up of Energy supply companies, utilities; engineering and construction firms; automation, control and equipment manufacturers; equipment supplies and/or installers; consulting firms, energy auditors, and other energy specialists with these companies providing a wide range of services related to energy.

In Ireland, there is a recognised history in community energy management, from informal fuel buying partnerships such as can be seen in Castletownbere Fishermen's co-operative where a group of individuals banded together to bulk purchase fuel and drive costs down, to more formal groups. The more formal groups include the likes of the Sustainable Energy Communities initiative led by the Sustainable Energy Authority of Ireland (SEAI) where organisations undertake a range of formal methods to develop a community energy masterplan. A 2019 report by the JRC Science for Policy Report noted that the ESCO market in Ireland was estimated at a value of around €20m.

While this general trust in community led energy exists, it has not yet translated to the development of the ESCO market in Ireland but signs of growth from 2015 onwards are encouraging.

7. BARRIERS

7.1. Mistrust from the potential client

Lack of trust between ESCOs and the potential clients usually arises from inhomogeneous ESCO offers in the market. The lack of market competition and absence of credible and visible reference cases with a clear client focus also presents a hesitation from the client's side to put their trust in ESCOs. Failed contracts and lack of standardized measurements and verifications (M&V) present a vague and unclear view of energy efficiency contracts. [6] This was backed up further by lack of trust showing as a major barrier in the 2019 survey for the JRC Science for Policy Report alongside complexity of the concept and lack of information in the UK.

In Ireland, the JRC Science for Policy Report notes that the main barrier identified for the development of ESCOs within the region is the unavailability of experienced trusted advisors and facilitators to set up an ESCO. Other issues identified included issues around Brexit and proceeding with large projects during a time of uncertainty and issues around the development or use of Energy Performance Contracts. The market has only really begun to mature since 2015 and these issues would be anticipated in the early stages and ways to overcome these must be identified to move things on.

Finland is another NPA regions which demonstrates a high level of mistrust from potential clients in the development of ESCOs, with this concern ranking equal first among all concerns expressed along with a fear of a lack of existence of technical expertise and inexperience of the actors involved. This perhaps suggests a lack of awareness of the range of ESCOs developed within Finland and hints that awareness of these existing ESCOs is low and needs improved.

7.2. Long project development cycle and high financing cost

ESCOs have faced continuous challenges because of the long development time for an ESCO project i.e., 12-24 months depending on the maturity of the energy services market and also the client. Furthermore, many projects are aborted after significant time and effort have been invested by the ESCOs to educate the customer on the ESCO project details. [10]

In the UK, Portsmouth council set out to become just the third local authority to set up an ESCO when it set out a proposal in 2017 to form Victory Energy. Rather than follow the template set out by the previously successful projects within the UK, the Portsmouth proposal diverged slightly in the method used. Due to the high levels of financing required at the outset, the council proposed to bring in a private individual with access to the required funding to get the ESCO up and running. Once the ESCO was established the council would then be required to buy the private individual out, which could present a large cost to the council if the ESCO had been a great success.

The council itself was due to invest £4m at the outset to get the ESCO up and running and it was to be a joint venture, as noted above, but another key difference between this set up and others was that the Portsmouth proposal is that the Portsmouth proposal leveraged private sector energy supply rather than the usual model which establishes an energy service company with a wider remit including public education and awareness and providing services that are needed but missing from the majority of private energy suppliers, such as lowering energy use and promoting energy efficiency.

In addition to the other hurdles, the rate of interest on borrowed money in many developing countries has been quite high. Often it leads to a competition between different potential projects where energy efficiency projects have to compete with other business proposals with a requirement of positive Net Present Value (NPV) in 2-3 years. In many cases, where attractive energy efficiency

projects with an excellent return on investment (ROI) are available and the client is responsible for the capital investment, the banks are not willing to extend a loan without burdensome collateral which the client is unwilling to accept. [10]

7.3. Key policy mechanisms missing in most countries

The key policy support and mechanism to uptake ESCO projects is missing in most countries around the globe. The two countries US and China responsible for 85% [9] of the global ESCO market serious governmental commitments, incentives, and policy support for the energy efficiency programs.

US Federal/State government and a large chunk of public schools and university buildings have large energy bills and have aging buildings infrastructure (Figure 8). They are required to reduce their energy bill under Energy Policy Act and subsequent Executive Orders.

For the sake of rigorous policy enforcement, the US government incentivized ESCOs with really low-interest rates during the same period and consistent technical support and project facilitation from a very strong Federal Energy Management Program (FEMP) which has led to a billion-dollar energy services market. [10], [11]

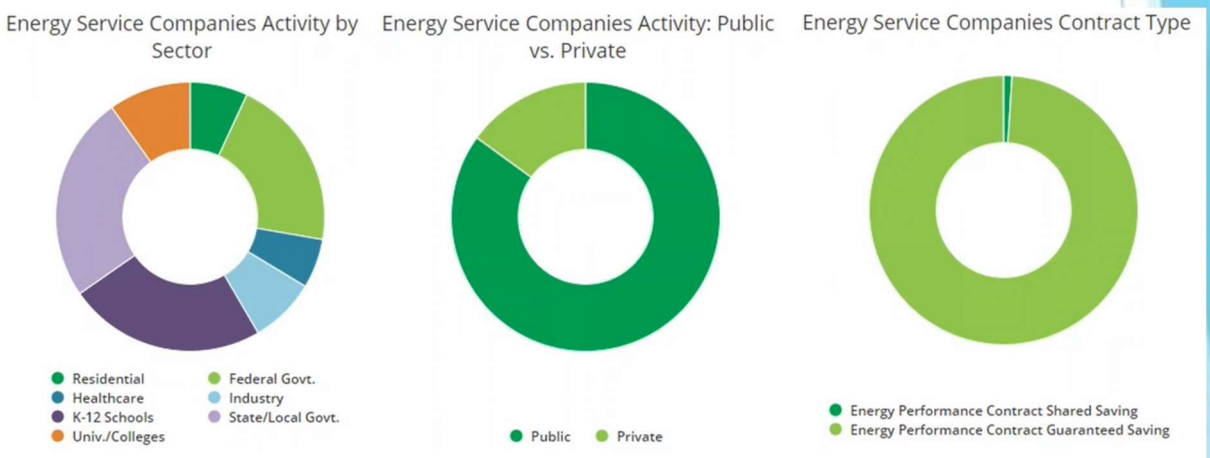

Figure 8: Governmental policy-driven ESCO market in the US (IEA) [12]

In China, the government has increasingly placed a strong emphasis on the energy efficiency of its industries and its buildings. Chinese relatively healthy economy has been able to provide sizable incentives to ESCOs operating in China to undertake energy efficiency projects on a large scale, especially in industries.

While in Europe, policymakers have consistently talked about the need for intense retrofits to improve the energy efficiency of its building sector. They did establish the Emissions Trading Scheme (EU ETS). These measures have led to, at best, mixed results for the ESCO industry. In many developing nations, ESCOs have largely been supported through pilot projects under multi-lateral banks and development organizations' projects and have largely failed to gain traction once the support has been withdrawn.

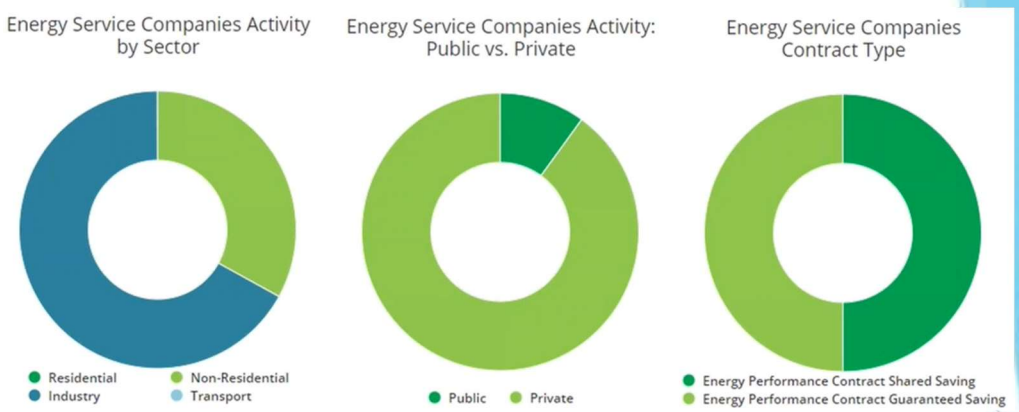

Figure 9: Industry and non-residential sector-driven ESCO market in China (IEA) [12]

The UK has seen the encouragement of ESCO development through a range of initiatives that include Energy Efficiency Directive, financial incentives, taxation rebates and voluntary agreements. Other drivers have included funding opportunities provided by the Green Investment Bank carrying out activities such as investing in energy efficiency projects and developing financing products for project developers including energy service companies. So rather than specific policy guidance the development has come about more through the existence of ad hoc funding mechanisms.

In Finland the development of the ESCO market has been led by a sustainable development company called Motiva. Motiva provides and maintains a list66 on energy service providers, businesses that perform energy audits, individuals who issue energy certificates and ESCOs. Motiva also provides information on its website on available subsidies for the EnPC projects. Moreover, Motiva has developed an ESCO project register, into which companies can enter information on implemented ESCO projects.

The Sustainable Energy Authority of Ireland has been providing a push to develop ESCOs by encouraging them to take up agreements with clients via the use of Local Energy Supply Contracts. For the purposes of the program any “energy” referred to covers electricity and heat, or both.

SEAI sets out three contract models to try and encourage development in this area – Operate and Maintain, Without Finance and With Finance. This means that organisation at various stages of the journey should be able to find the correct level of the program to enable them to begin their development. SEAI has broken the value chain down into 6 stages – Finance, specify design, build, supply fuel, operate & maintain and sell output.

ESCO development seems to, in the main, be led by individual organisations rather than truly being encouraged by policy.

7.4. Technical and economical awareness

The absence of best practice examples and their positive impact is very often identified as one of the main barriers limiting ESCO implementation. The lack of technical knowledge among end consumers regarding the economic potential of energy savings continues to suppress the uptake of energy contracting projects. [6]

In another scenario, if the customer is self-aware of the energy efficiency concept and the related cost savings, quite often the customers’ expectations are based on an old energy audit or an internal assessment which typically uses a simple calculation to show paybacks of 2-5 years. ESCOs, when

asked to provide a complete project layout for performance guarantee, will add installation and commissioning services, project management, financing, technical manpower, M&V cost, and their margins to design and execute the project involving performance guarantees. The breakeven point typically doubles from the simple payback calculation that many customers start with. Consequently, the project gets aborted. [10]

7.5. Market size and transaction costs

Small-scale projects are not compatible with EPCs. For example, the reluctance of municipalities to engage in EPCs, which can be partly explained by the small structure of many municipalities, is an impeding factor for the uptake of energy performance contracting by the public sector [13]. The small size of projects and high transaction costs were identified as a barrier existing in many countries: Estonia, Finland, France, Germany, the Netherlands, Portugal [6].

8. CONCLUSION

ESCOs provide an opportunity to tackle increasing energy demand and control CO_2 emissions while exploiting market benefits for customers by decreasing the energy costs of their clients and making a profit for themselves. The global ESCO market currently revolves around two counties i.e., China and United States. Both give individual examples of two completely different cases, China being the industry-oriented market leader and the US being a public sector-oriented market leader.

The reason for the successful ESCO market in these countries is governmental policies and rigorous enforcement practices. Apart from these countries, the third substantial market for ESCOs is EU region. Germany and France are the main examples for energy supply contracting (ESC). Energy performance contracting (EPC) is still at early stages in the EU. The reason for that is the different barriers faced by ESCO markets in EU countries.

The main barriers for ESCO projects include the absence of the key policy mechanism, high financing cost, customer awareness, and small size market problems. There are still many EU states that are either at the stage of kick-starting their markets (Cyprus, Estonia), while others have already invested policies and/or resources, but could not excel in energy services at an expected pace or have experienced a halt (Bulgaria, Poland, Romania, Greece, Hungary, etc.). The energy service market in Europe is far from utilizing its full potential, even in countries with a, particularly developed ESCO sector.

A lack of expertise and a lack of visibility and awareness of successful, viable ESCOS projects is a major drawback that is noted across various regions on an EU wide level and particularly within NPA regions. Developing a strong, robust range of case studies and examples of successful projects is one way in which confidence in this model could be boosted and further uptake encouraged.

In developing countries, ESCOs projects have largely been supported through multi-lateral banks and development organizations funded pilot projects and have largely failed to gain traction once the support has been withdrawn.

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