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THE NON-DOMESTIC ENERGY EFFICIENCY SERVICES MARKET

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Contents

Executive Summary

The use of energy efficiency services providers offers a useful route for delivering high quality energy efficiency projects. Their delivery model can also be harnessed to provide the necessary investment finance as well. This study shows that while the UK's energy efficiency services sector is large in absolute terms, it appears to be relatively small in comparison with those of comparable economies. A recent reliable estimate[1] of the UK market indicated that the market totalled £349m in 2017.

While the energy efficiency services market may be smaller than expected, the UK's energy efficiency performance is good. A number of distorting factors could account for the smaller than expected energy efficiency services market, such as differences between nations in terms of the economic mix, and the degree to which organisations have self-delivered savings rather than relying on specialist help from energy efficiency services companies.

While the UK sector is not as large, it has grown steadily over the past few years, strongly driven by public sector procurement frameworks. Respondents to this study estimated that over recent years the median rate of growth has been 15% per annum. They also estimated that future growth would be around 10% per annum, while Navigant calculated the annual growth at around 7% between 2017 and 2026.

Estimates indicate that if the UK energy efficiency services market is to make a strong contribution to delivering the fifth carbon budget for non-domestic buildings alone, it will have to grow at an annual rate of almost 20%, reaching an annual revenue of almost £5bn in 2032. The requirement to implement measures in other non-domestic sectors beyond buildings, such as in industry, will add significantly to this figure.

In common with the UK, other nations have been active in stimulating demand for non-domestic energy efficiency. We have therefore examined markets in Germany, the USA, France, Finland and Denmark to identify some lessons learned that are suitable for the UK market. As an example, the USA has set energy savings targets in federal buildings and has targeted energy services providers as the preferred delivery mechanism for these.

[1] Navigant Research, 2017

As the UK examines policies and interventions to stimulate the energy services market, it is clear that there is a lack of publicly available data on the UK market that extends to the volume of projects implemented in the UK public sector. This lack of data may be one of the reasons holding the market back, as many potential clients for energy services will not see enough case studies of success to give them confidence in what they might see as a novel and potentially risky contractual relationship.

While respondents cited cost reduction as one of the strongest driver for clients interested in energy efficiency, they pointed out that efficiency is still not salient to many business decision makers. In conversations with certain stakeholders, it appears that this issue is the key determinant of whether a company will engage in energy efficiency activity or take up an energy services contract. Salience emerges from the significance of energy costs to a business, and also links to knowledge and capacity to take decisions on energy. For most businesses, who have relatively low energy intensities, salience is seen by energy services providers as more important than their specific business activity.

The importance of quality of service, and its impact on trust in the energy services solution was also highlighted by stakeholders. Trust is particularly important, because if a potential client trusts a service provider, they will then be willing to outsource some of their efficiency requirements. Energy services companies emphasised therefore that they see a strong role for government in developing quality systems to solve this problem.

Finance is not seen as a major barrier to UK energy services contracts, but it is felt that high transaction costs do inhibit service providers from targeting smaller firms. Methods for streamlining and aggregating contracts to reduce these costs could be seen as valuable for building economics of scale.

A number of policy recommendations were developed in this study, based on international research and the suggestions of stakeholders. The UK has implemented a number of measures to increase interest in energy efficiency, which are likely to benefit the energy services market. The targeted public sector procurement frameworks are a good example of this. There are also some international examples from which the UK can draw useful lessons, both for developing entirely new interventions, but also for optimising ones already in place. This study identified several useful interventions, including:

- Promotion of standard contract terms, methods and guidance to improve confidence in the energy efficiency services solution.
- Develop innovative methods for recovering the costs of energy efficiency investments that reduce transaction costs and perceived risks.
- The government to adopt Energy Performance Contracts for its own premises even more quickly than at present to develop the market.
- The government setting minimum energy efficiency standards that must be met by suppliers in order to supply into the public sector.
- Setting up and policing a national registry for energy services companies.
- Developing energy efficiency networks to raise awareness of efficiency measures, including energy services contracts.
- Setting up and running private sector procurement frameworks to reduce transaction costs for entering into energy performance contracts.
- Compulsory implementation of measures identified in ESOS surveys.
- Modifications to the Minimum Energy Efficiency Standards for rented commercial properties to send stronger signals to prospective tenants.

The following intervention options were investigated in more detail:

- Promotion of standardised Energy Service Company (ESCO) contract terms, methods and guidance.
- National registry for energy services companies.
- Energy efficiency networks to boost demand for improved energy efficiency.
- Private sector procurement frameworks for providing support during procurement.

Useful next steps beyond this study include developing more detailed insights into potential policy options and setting up permanent processes to regularly collect more reliable information on the volume of contracts in the UK energy efficiency services market.

Definitions[2]

- "Building Management System": A computer system that monitors and controls building functions including security, lighting, heating, ventilation and air conditioning. Frequently used to optimise the energy performance of a building.
- "Combined heat and power" (CHP): An installation where power is generated using delivered fuel and heat is recovered from the exhaust for a beneficial use. A popular measure deployed under energy services-style arrangements.
- "Consultancy": The provision of energy efficiency advice that can include energy surveys, planning of measures and monitoring of the performance of measures, but does not extend to involvement in the installation of equipment.
- "Energy efficiency services provider": a general term covering all organisations who offer advice, equipment, operational support and project management services related to the identification, delivery and management of energy efficiency measures.
- "Energy service": the physical benefit, utility or good derived from a combination of energy with energy efficient technology and/or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings.
- "Energy Performance Contract (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. The term may also apply where the client provides investment, but a performance bonus or penalty is due to the installer, based on whether or not savings targets are achieved.
- "Energy Services Agreement (ESA)": a contractual arrangement between a beneficiary and a services provider in which an energy efficiency or energy supply measure is installed and financed under a performance contract. Sometimes treated as synonymous with the EPC model, in an ESA the provider specifically finances the installation and recovers costs via services charges.

[2] Definitions taken from Directive 2006/32 EC and from general literature.

- “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 Supply Contract” (ESC): A contractual arrangement whereby a service provider supplies an energy-related commodity to a customer, such as electricity, hot water, steam, power or compressed air. The supplier may take responsibility for operating and maintaining the client’s plant, or may install its own supply equipment.
- “Guaranteed Savings”: A form of EPC contract between a service provider and a client whereby the client sources and repays the finance. The energy efficiency services provider is paid for the installation of the efficiency measure and will make subsequent compensatory payments to the client if the guaranteed level of performance is not met.
- “Performance Guarantee”: A contract between a service provider and a client whereby the provider installs equipment and warrants its performance compared to a pre-agreed baseline.
- “Shared Savings”: A form of EPC where the energy efficiency services provider or a third party supplies the investment into the project and the investment is repaid from the project savings cash flow that comes initially to the service provider. The client is not obligated to repay the debt, only to provide the contracted fees related to the project savings.
- “Third-party financing”: a contractual arrangement involving a third party — in addition to the energy supplier 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.
- “White certificates”: certificates issued by independent certifying bodies confirming the energy savings claims of market actors as a consequence of energy efficiency improvement measures.

Overview and Rationale for Study

The Department for Business, Energy & Industrial Strategy ("BEIS") commissioned IPA Advisory and Databuild to carry out research into the non-domestic energy efficiency services market, in which organisations improve their energy efficiency by outsourcing work to separate service providers under contract. These energy efficiency service providers have specialist skills that can deliver energy improvements more effectively than in-house teams and can also mobilise external finance to pay for measures. The combination of specialist expertise and access to finance can potentially allow the energy efficiency services clients to overcome the barrier of access to finance they might be facing and which inhibits them from investing in energy efficiency.

Despite the potential for this service-based model to improve energy efficiency, a number of major markets, including the UK, continue to see that many viable energy efficiency projects remain unimplemented (see for the UK case in Annex 1). In such cases, clearly the non-domestic energy consumer has both failed to take them forward or to outsource the opportunity to a service provider. In order to address market failures, a numbers of countries have applied different measures to overcome barriers and to drive the market.

This research project was designed to improve understanding of the UK market, gather the views of UK stakeholders and to identify international lessons that could be useful to stimulate UK uptake of energy efficiency services. The project defined a set of questions (as shown in Annex 2), combined desktop research and stakeholder engagement with key industry participants to produce:

- Quantitative data on the size, shape and trends of the UK market;
- Analysis of stakeholders views on the needs of the UK market, including priority drivers, barriers and enablers,
- Examination of how other countries have developed their energy services markets and potential actions to support the market that maybe transferable to the UK.

It should be noted that the stakeholders, both those interviewed and also those who participated in structured workshops, who generously contributed their time to this project, were recruited from within the UK's energy efficiency services industry.

Consequently, the findings of this report might have a narrower perspective than if a wider range of stakeholders had been included from:

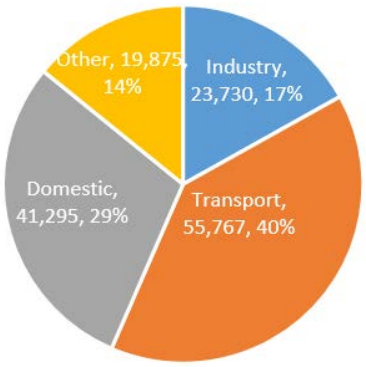
- Adjacent sectors who may also touch on energy efficiency issues.
- Potential clients who are not yet engaged with the services sector offering.
- Academic experts.

The Energy Efficiency Services Market

The UK has an ambitious goal[3] of reducing greenhouse gas emissions by 80% compared to 1990 levels by 2050. At present, the UK has a large mixed economy, with a low energy intensity relative to its status as a developed nation. In 2015, the UK had the world's 5th largest economy by nominal GDP, but was only the 14th largest user of energy[4]. More detail is available in Annex 1.

Data from BEIS[5] shown below in Figure 1 shows that non-transport and non-domestic energy represented 31% of UK consumption in 2016.

Figure 1: Final energy consumption in 2016 split between sectors in ktoe[6].



Of this 31% of UK delivered energy, around half is related to industrial processes, and the other half is non-domestic buildings related; both critical for supporting the UK's long-term decarbonisation goals. It should be noted that it was easier to trace information on buildings-related energy efficiency and projects, but more difficult to identify the scale of the opportunity for industrial processes. Buildings energy efficiency measures are much more homogeneous across businesses and are therefore of particular interest to energy efficiency services companies, because of

[3] As shown in more detail in Annex 1.
[4] Data from The World Factbook - Central Intelligence Agency and national government websites.
[5] Energy Consumption in the UK: 2017 Update, BEIS, 2017.
[6] Ktoe: kilotonnes of oil-equivalent energy

the similarity of the technologies needed. Industrial process energy efficiency is more specialised and difficult to address.

Benefits of Using Energy Efficiency Service Providers

It is a complex and difficult for an organisation to consider whether to invest resources into energy efficiency, as it may be a non-core area within business operations. Organisations also require specialist skills to identify, install and manage energy efficiency measures, which they may not have.

The relative importance of energy as a cost to a business depends on energy intensity, and therefore even small companies may devote significant time, resources and expertise to managing energy. However, when energy is a relatively small element of an organisation's cost base, even quite large concerns may not pay sufficient attention to energy efficiency opportunities. They may struggle to justify supporting staff with specialist skills[7]. When low energy intensity is combined with smaller scale, this problem is compounded.

The aforementioned gap can be filled by specialist energy services providers, whose businesses can afford to maintain the detailed knowledge required to manage energy more efficiently[8]. These companies are the energy service providers, who can design, install, and performance manage energy conservation measures under a range of contractual structures and may also arrange finance as well.

Status of the UK Market for Energy Services

Business models where a service provider plans and install measures on behalf of clients have been growing in popularity around the world. In the UK, this market has taken longer to experience strong growth and is still short of its full potential. Comparisons seen in Table 1 and based on data from Navigant[9] and the OECD[10], show that while the UK's energy efficiency services market is relatively large in absolute terms, it is smaller relative to GDP than that of its peers.

[7] Energy efficiency programmes for small and medium-sized industry, Shipley and Elliott, ACEE Proceedings, 2001.
[8] Catalysing the energy services market: The role of intermediaries, Nolden et al, Energy Policy 98, (2016) 420-430.
[9] Navigant Research, 2017.
[10] OECD, Aggregate National Accounts, SNA 2008 (or SNA 1993): Gross domestic product.

Table 1: Estimates of UK non-domestic energy efficiency market size[9].

Nation	Energy Efficiency Services Market 2017 ($m)	GDP 2017($m)	Relative market volume ($/$m GDP)
USA	$7,600	$19,390,604	392
Germany	$1,500	$4,193,923	358
Canada	$400	$1,701,784	235
France	$507	$2,866,125	177
United Kingdom	$443	$2,896,831	153

State of the UK market

The UK market is more biased towards energy performance contracting than to energy supply contracts, and shares more similarities with the market of the USA than with those of Germany and France. The UK market has grown steadily and now has a good state of development of the EPC services sector [11]. According to participants in this study, the UK EPC market has recently been driven strongly by the public sector demand for efficiency retrofits. The UK is not alone in having had difficulties in developing a stronger private sector EPC market and a lot of activity in international markets is taking place to correct some of their identified faults.

Types of Energy Efficiency Services Company

A wide range of companies are involved in providing energy efficiency services, and the boundaries between their activities can be blurred. Their efficiency services businesses are often based on expertise, information and relationships, rather than capital equipment. This allows them to relatively rapidly modify their service model

[11] Energy Service Companies in the EU, Status review and recommendations for further market development with a focus on Energy Performance Contracting, BOZA-KISS, Benigna, BERTOLDI, Paolo, ECONOMIDOU, Marina, 2017, EU|R28716 EN

and offering to suit client needs. While some service providers are independents, some may be divisions within larger companies, with a different main business focus. They may also be independent specialists in a particular technology, or divisions of larger technology companies that use their main businesses sales channels for their related service offering. Common examples of this are energy suppliers, equipment suppliers, energy brokers and facilities management companies, who can build client trust through their main offering that then clears the way for the more challenging energy services proposition.

Based on their mode of operation, the main categories of service providers are:

- Energy Services Companies, (ESCOs), who offer turnkey energy efficiency projects, covering project lifecycle stages from assessment to procurement and implementation, through to successful operation. Their preferred contractual model is the Energy Performance Contract (EPC) that offers performance guarantees and accepts a risk premium. They also carry out projects on a simple fee basis.

- Consultancies, who offer advisory services support to organisations on energy efficiency related projects, usually for up-front fees, but sometimes on a performance-related success fee basis.

- Equipment suppliers and installers, who support packages designed or implemented by ESCOs or energy efficiency consultancies, but who may also decide to enter into energy performance contracts for specific technological and equipment solutions and also provide some kind of vendor financing including sale and leasebacks.

The financiers are also very important stakeholders since they provide the necessary project funding. Other important stakeholders, depending on the contractual setup, are certain types of intermediaries and facilitators. More precisely:

- Financiers include specialist investor and debt providers, who specifically supply equity and debt finance, as well as credit finance and forfeiting, retail banks who provide loans to business, and specialist vendor financiers, who maintain the title to installed equipment.

- Intermediaries and aggregators, who bring projects together, package them by sector, technology or region and improve cost efficiency by building common implementation, financing and contractual structures.

- Facilitators generally sit on the client side of an energy performance contract, providing advice and quality systems to level the information asymmetry that otherwise exists between an inexperienced client and an energy services provider. They can be private consultancies, but for public sector contracts tend to be government agencies. They can also facilitate access to finance for projects.

International Review of Best Practice

Method for Selecting International Case Studies

In order to build an understanding of international best practice in stimulating markets for energy efficiency services, this study examined market conditions and interventions around the world. It predominantly covered the main EU markets, certain non-EU OECD members outside of the EU, BRICs and Asian Tiger economies[12]. A basket of metrics was used to identify the most successful markets. Limited data was available for all nations, and key information could only be sourced for EU nations and some other countries that geographically neighbour the EU. In developing the rankings, the following considerations were taken into account.

- Market size was an important indicator of success and the analysis was weighted in favour of markets that are large relative to the size of the economy.
- Market growth was also considered to an important metric, although it proved very difficult to obtain consistent and reliable information on this.
- The regulatory framework linked to the energy efficiency services market was also important for distinguishing markets that were worth future examination. An iterative examination of policies and positive features linked to the energy efficiency services market was carried out to identify the nations that had been most active. This detailed analysis was applied to a representative sample of countries from the overall population due to resource and time constraints. The main results are shown in Annex 3.
- Positive market characteristics were felt to be only moderately important in identifying case study markets, as they dealt with outcomes rather than the actions that were of interest to this study. Unfortunately, consistent information was only available for EU member states and neighbouring countries. The data was therefore used to identify key topics for the interview guides and workshops.

[12] Nations examined were, eliminating duplicates, **EU:** Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK; **OECD** (members outside of the EU)**:** Australia, Canada, Chile, Israel, Japan, Korea, Mexico, New Zealand, Norway, Turkey, Switzerland, and the United States of America; **BRIC:** Brazil, Russia, India and China; **Asian Tigers:** Singapore, ChineseTaipei, Hong Kong (China) and the Republic of Korea.

- Effectiveness in dealing with market barriers was important for selecting countries of interest. Unfortunately, consistent information was only available for the EU member states and neighbouring countries. The data was used to identify key topics for the interview guides and workshops.

Finally certain markets were excluded from consideration based on either their small size relative to the UK, such as Ireland, or the existence of significant legal incompatibilities, such as China.

The final weighted rankings for nations are shown in Table 2.

Table 2: Table of weighted national scores and the market size/legal compatibility pass/fail tests.

Nation	Weighted All World (High score is better)	Comparable size or activities to UK market?	Legal / political compatibility with UK?
USA	**1.00**	**Y**	**Y**
China	0.75	Y	N
Ireland	0.50	N	Y
Germany	**0.50**	**Y**	**Y**
France	**0.44**	**Y**	**Y**
Denmark	**0.44**	**Y**	**Y**
Finland	0.25	N	Y
Canada	0.25	Y	Y
Spain	0.25	N	Y

Nation	Weighted All World (High score is better)	Comparable size or activities to UK market?	Legal / political compatibility with UK?
Netherlands	0.25	N	Y
UK	0.25	-	-
Singapore	0.19	Y	Y
Taiwan	0.19	N	Y
Slovak Rep.	0.19	N	Y
Japan	0.06	Y	Y

Based on the rankings and the legal and market size test, the nations picked for detailed case study examination were the USA, Germany, France and Denmark.

Overview of International Case Studies

The national exemplar case studies (given in more detail in Annex 3) are summarised below. These nations offer illustrations of how they have implemented similar market interventions to the UK, and also offer examples of other developments that could be considered.

United States of America

The USA scored well in rankings and is recognised to be the world's most innovative and fastest moving marketplace for energy services, with 47 ESCOs regularly offering performance contracting services into a market of a size that is between

$5.3bn[13] and $7.6bn[14]. In common with the UK, a significant proportion of the market is in the form of energy efficiency services contracts.

The US market is strongly driven by government buildings energy efficiency commitments at Federal and State and Municipal levels. These commitments are stronger than those in the UK, and are more prescribed. For example, Federal commitments also include requirements for agencies to outsource energy savings measures to service providers. The market for private energy services has grown in tandem, and around 7-8% of the market relates to private sector projects. An emerging market driver is the increasing number of local governments requiring that landlords must disclose the operational energy costs of rented properties.

Energy performance contracts are now used by firms whose core business is the installation of equipment as well as by ESCOs – a market feature now found in the UK as well. The US market is also particularly innovative in the area of finance, with a strong municipal bond market for local government projects and securitisation of delivered efficiency projects. Innovation in recovery of investment costs has also taken place, with the Commercial Property-Assessed Clean Energy methodology (C-PACE) linking repayments into the property tax system in order to overcome split incentives and unlock lower risk finance. The Pay for Performance model is also being developed in the USA, where lower costs for capturing detailed energy consumption data is allowing utility demand side management programmes to effectively subcontract more complex projects with deeper savings to ESCOs[15].

Germany

The German market is one of the largest in the world, and is mainly composed of energy supply contracts. However, according to recent estimates as many as 30 out of the nation's 500 or so energy services providers also offer energy efficiency services. Germany has recently developed several market interventions to support energy efficiency, which will also increase demand for related services. Small to Medium-Sized Entities, ("SMEs"), are a priority target group, with grants to assist in engaging energy services companies, and the government has collaborated with banks to set up a loan guarantee scheme for SME energy efficiency projects. An urban renewal programme assists in developing energy efficient local regeneration

[13] U.S. Energy Service Company (ESCO) Industry: Recent Market Trends, LBNL- 1006343, Lawrence Berkeley National Laboratory, 2016
[14] Navigant, 2017
[15] Putting your money where your meter is: A study of pay-for-performance energy efficiency programs in the united states Prepared for the Natural Resources Defense Council and Vermont Energy Investment Corporation, JANUARY 2017 R: 16-09-A

projects, while local efficiency networks help local companies to exchange ideas and collaborate on efficiency opportunities. An innovative programme called "STEP up!"[16] allows companies to bid for investment in energy efficiency projects, with the investment going to the submission that offers the lowest cost per kWh of energy saved.

France

France has the longest established and one of the largest ESCO markets in the world. In contrast to the UK, the French market is mainly made up of energy supply contracts and only around 6-7% of the market is for energy efficiency. Of the 350 or so ESCOs in France, only around 10 offer efficiency services. France has developed a strong national consensus on energy efficiency as part of its "Grenelle de l'environnement"[17] stakeholder consultation process and this has assisted in the development of stringent energy efficiency regulations. Whilst challenging targets for efficiency and upgrading of public buildings are important, the major tool for delivering efficiency in the public and private sectors is an energy supplier efficiency obligation set up in 2006. This scheme is more flexible than the UK's version, allowing energy suppliers flexibility to invest in efficiency across a wide range of technologies and customers, including commercial and manufacturing sites. This scheme is highly successful, although to date most measures installed have been buildings-related.

Denmark

Denmark's ESCO sector is relatively young, having started in the early 2000s. It rapidly developed a large number of ESCO start-ups, which have now consolidated into a more compact sector that services larger projects. The public sector is mainly responsible for driving the market for energy efficiency projects, but there has also been some activity in the industrial and commercial sectors, driven by a flexible energy efficiency obligation placed on energy suppliers. This obligation scheme mandates suppliers to achieve savings amongst their customer base, and if a customer is outside of a supplier's distribution network, an independent ESCO must deliver the savings. So far, Denmark has found that the scheme is very effective for delivering industrial savings projects, due to the simpler decision making process for industrial processes compared to buildings refurbishments. The main driver for energy efficient refurbishment of buildings is the requirement to meet very tight and regularly reviewed standards for buildings that come onto the rental market. It is not clear to what extent the refurbishments are by specialist energy service providers.

[16] https://www.stepup-energieeffizienz.de/
[17] Civil stakeholder consultation format employed in France.

Method for Selecting Topic Case Studies

Through an examination of a consistent EU-region review carried out in 2012, an outline picture was developed showing areas where aspects of the UK's market and legislative environment tended to lag behind. Despite the age of this review, it was felt that it gave useful pointers to guide the workshops and their discussions on the current state of the market. The overall result is shown in Table 3 below, which includes additional barriers and enablers suggested by workshop attendees:

Table 3: UK barriers and market enablers needing improvement in 2012.

UK Barriers and Enablers that need addressing
Barrier 1: Split incentives.
Barrier 2: Legislation for defining ESCOs and EPCs.
Barrier 3: High transaction costs.
Barrier 4: Lack of Trust.
Enabler 1: More availability of finance.
Enabler 2: Removal of restrictive factors in the private sector
Enabler 3: Information and demonstration case studies.
Enabler 4: Improved trust.
Enabler 5 Lack of salience of energy efficiency.
Enabler 6: Improved industrial process knowledge
Enabler 7: Lack of client decision making capability

Based on the workshop outputs, it was recognised that the areas where the UK could potentially learn from international best practice were:

Incentivisation of the market

Topics covered:

- Building energy labelling, energy awareness for tenants and green leases to overcome split incentives use peer examples to encourage interest. (Barrier 1, Enabler 3)
- Use of financial incentives, possibly via energy supplier obligation schemes, to overcome the salience barrier for energy efficiency. (Enabler 1, Enabler 5)

Aggregation and standardisation

Topics covered:

- The value of official guidance on ESCOs, EPCs and contractual terms to make clients more comfortable with the companies and contracts with which they are dealing, reduce transaction costs and reduce the inhibitory effect of low knowledge amongst clients. (Barrier 2, Barrier 3, Enabler 2, Enabler 7)
- Use of quality schemes in an energy performance context to improve trust in the energy services solution. (Barrier 4, Enabler 4)
- Improvement of energy efficiency skills amongst industry and process knowledge amongst energy efficiency services providers, improving the quality of service and improving client trust in the sector. (Barrier 4, Enabler 4, Enabler 6, Enabler 7)
- Local company networks and large energy user networks for helping companies and especially SMEs to share knowledge, gain close experience of local peer case studies and gain confidence in energy efficiency. (Enabler 3, Enabler 5, Enabler 7)

Overview of International Topic Case Studies

A summary of the two topical case studies on aggregation and standardisation, and incentivisation, is included below. Full details are given in Annex 3.

Aggregation and Standardisation Case Study

This case study examined how different markets have approached standardisation of energy efficiency services offerings. The development of the International Performance Measurement and Verification Protocol in the USA has improved confidence in the integrity of the energy performance contract concept. It now acts as the de facto standard for verifying project energy savings around the world. New technology is also reducing the cost of contractual verification and in the USA may even be unlocking innovation in pay-for-performance energy (P4P) service models that offer larger savings to drive market uptake.

Linked to the issue of standard protocols, UK stakeholders consulted in this project also believe that more detailed information on how EPC contracts work could greatly help in growing understanding and client trust. While no evidence is available to support this, several governments offer detailed guidance. The Energy Efficiency Council of Australia offers clear guidance on best practice in energy performance contracts, while the USA's Energy Efficiency and Renewable Energy Agency has developed a comprehensive detailed guidance and templates for every stage of planning and implementing an energy performance contract. While the UK does have standard terms available[18,19], this appeared not to be top of mind amongst workshop attendees and telephone respondents, and may indicate that either better marketing or more useful contents for the guides are needed.

Related to the issue of clients having trust in standard methodologies, UK stakeholders also raised the issue of how the inconsistent quality of energy service providers is damaging trust. Many overseas markets have government-run voluntary registries or requirements for accreditation as an energy services provider, such as in Italy, Dubai, Finland, Singapore and South Africa.

The need for better trust in and understanding of energy efficiency has been demonstrated in Switzerland, where the Learning Energy Efficiency Network has been a long-term policy. A similar approach is being adopted in Germany to give access to smaller local businesses local businesses and has been delivering large

[18] Energy Performance Contract (EPC) contract guidance note and model contract, DECC, 15D/012, 2015
[19] Guide to Energy Performance Contracting Best Practices, DECC, 15D/011, 2015

savings (10%). A partnership approach focused on large companies is run by Ireland's Large Industry Energy Network.

The UK appears to have a successful set of public sector procurement frameworks[20,21], and the continuity of these schemes has been very important. This has been a failing of other, shorter-lived programmes in Austria and Denmark. While the UK has concentrated on public sector procurement frameworks, India and Dubai have developed similar frameworks that are open to the private sector. Some countries have targeted energy services in a particular technology that has strong market potential, as was done with an EU funded facilitation that kick-started street lighting energy performance contracting in several nations.

Success factors in aggregating and standardising include:

- Ensure that initiatives for spreading information are linked up to make finding information easy.
- In early stages of self-supporting energy networking programmes, significant government support is needed.
- Quality systems can offer a light touch for new registrations to encourage new market entrants.
- Either run quality systems through government of give official sanction to independent systems.
- Adopt tools from elsewhere to gain the advantage of the development and trialling work already carried out.
- State sponsorship of frameworks and Super ESCOs in their early stages.

Incentivisation Case Study

For the purposes of this study, incentivisation was interpreted to cover both positive and negative incentives to act. The UK has used Climate Change Agreements over a long period to stimulate and support interest in energy efficiency. In other nations, these are also prominent. In Finland, such agreements are the main route for delivering industrial energy efficiency and are linked to subsidies for new technology and other support, while Canada is enabling agreement participants to make public

[20] Energy Service Companies in the EU. Status Review and Recommendations for Further Market Development with a Focus on Energy Performance Contracts, Boza-Kiss et al, EUR2817, 2017.
[21] Private communication to IPA Advisory from a director of the division of a large energy services provider based overseas, 2018.

relations use of a voluntary Energy Star® benchmarking. The UK's scheme for energy surveys in industry, the Energy Savings Opportunity Scheme has no obligations on organisations to implement measures; however, the schemes in several other nations do include requirements to act. The schemes in Italy, the region of Flanders and Russia require organisations to conduct regular audits, to plan for energy efficiency and to implement cost-effective savings measures.

Research shows that businesses, particularly smaller ones, struggle to plan energy efficiency measures. To solve this, the USA has provided Energy Star® branded tools to help with implementation of performance contracts and to help managers to organise savings across portfolios of buildings. Canada is adapting the same tools for its national programmes. UK stakeholders consulted during this study mentioned the difficultly of implementing energy efficiency services with smaller companies due to financial hurdles related to scale. Germany is assisting smaller organisations to help them to engage with energy efficiency services suppliers, while a guarantee scheme aims to reduce the cost of finance to smaller companies. Germany has also used a publicly owned bank to provide low cost long-term finance to communities, municipalities and companies, while companies can also fund energy efficiency measures through an innovative auction system that obtains best value for public money.

While the UK has a long-standing programme of obligations on energy suppliers to implement energy efficiency measures, these apply to their domestic clients only. However, France and Denmark have successfully used supplier obligations to deliver savings in non-domestic sector, and to incentivise the use of energy efficiency services for delivering projects.

The UK has strong central government public sector carbon reduction targets and procurement frameworks are now delivering significant energy savings. Mandatory public sector energy efficiency targets in the USA have also driven reductions in consumption and have stimulated the energy efficiency services market, as there are requirements to sign up to a certain volume of Energy Performance Contracts.

The UK has met EU Energy Performance in Buildings Directive with a number of measures, including, since 2008, mandatory energy labelling for all properties that are rented or sold. More recently, the UK's Minimum Energy Efficiency Standards for privately rented properties has established minimum performance standards for landlords. Australia's NABERS building energy labelling scheme also provides prospective tenants with operational consumption figures for energy, water and waste, and has been widely used. While being voluntary for smaller commercial office space, it is compulsory for offices of over 2,000 square metres. It has led to

highly rated buildings being more valued by tenants and attracting higher rents. In the USA, “Benchmarking and Disclosure” schemes are delivering similar results. Other schemes in Denmark, France, India, Russia, Japan and South Korea are less detailed. In Denmark, despite the scheme not supplying projected operational energy costs, it has delivered good results.

Success factors for incentives appeared to be:

- Simplicity, reducing transaction costs for those engaging with them.
- Wide applicability, allowing fair access by more potential participants and growing potential for innovation and larger savings.
- Linking their use to offset the impacts of potential penalties and reduce opposition.
- Allowing participants to use their achievements to showcase success, helping to develop positive pressures for improvement within peer groups.

UK Energy Services Market Review

Estimates of UK Market Size and Potential for Growth

It is difficult to estimate the scale of the UK market for non-domestic energy efficiency services. There are a number of reasons for this:

- Energy efficiency services contracts are not publicly registered, and even the numbers and sizes of public sector contracts are not gathered in one place or even formally reported.
- Clients can be sensitive about outsourcing services, and commercial confidentiality may inhibit them from publicising contracts and contract sizes.
- Gathering data from direct surveys of market participants is expensive, and again confidentiality may conceal some projects.
- Some energy efficiency services may be bundled deeply within integrated facilities management contracts and they may be difficult to separate out.

These mean that projects in the public sector, being less commercially sensitive are more likely to be uncovered in any small-scale survey such as this, while industrial and integrated facilities management efficiency projects will be under-represented.

Several estimates of the UK market were developed based on the methodologies described in Annex 4.

Table 4 shows two estimates based on data from the BEIS Building Energy Efficiency Survey[22]. These estimates rely on identifying the total investments needed to deliver as yet unimplemented short term and long-term payback measures, and spreading them out over an arbitrary period of 15 years, taking them to the end of the UK's fifth carbon budget period. They will be an underestimate, as they cover buildings improvements only, and around another 50% of delivered non-domestic energy is contained in industrial processes. However, no data was available on the scale of industrial energy efficiency opportunity.

[22] Building Energy Efficiency Survey, BEIS, November 2016

Table 4: Estimates of UK non-domestic energy efficiency market size based on BEIS Building Energy Efficiency Survey data (BEES 2016).

Market potential lower bound for energy efficiency upgrades to non-domestic buildings	Market potential upper bound for energy efficiency upgrades to non-domestic buildings
£130m per year	£1.89bn per year
£1.95bn total investment	£28bn total investment
Three year payback threshold measures	7.6 year average payback measures
Measures spread over 15 years (to 2032)	Measures spread over 15 years (to 2032)
14% savings	39% savings
22,080GWh annual energy savings	63,160GWh annual energy savings

A sectoral breakdown of the £28.4bn total investment is shown in Table 5 below:

Table 5: Estimates of sector breakdowns for investment in non-domestic energy efficiency retrofits based on upper bound investment

Sector	Total Investment over 15 years £bn	Annual investment £m
Retail	5.8	386
Office	6.8	453
Hospitality	1.8	120
Industrial	4.6	307
Storage	2.5	167
Health	1.7	113
Education	2.1	140
Emergency Services	0.6	40
Military	0.3	20
Community, arts and leisure	2.2	147
All sub-sectors	**28.4bn**	**£1.89bn**

Table 6 shows estimates from Navigant Research of the current UK market size based on direct market research developed from interviews with UK energy services companies. This study searched for data on the volume of public sector retrofit

contracts, and subjected it to inflation to account for private sector activity, based on ratios in the USA[23].

Table 6: Estimates of UK non-domestic energy efficiency market size based on market research.

Data sourced from funding frameworks by this study (2017)	Navigant research estimate (2017)
£161m per year	£349m per year
Based on grossing up estimates of the total volume of public sector energy services contracts (capital projects) in the UK and inflating by an estimate for the additional private sector work not captured. There was no data available on the relative sizes of the public versus private sector markets in the UK. If the UK were similar to the USA, then the public sector would be around 91.5% of the entire market.	Navigant estimate from direct interviews with a large sample of service providers and based solely on energy performance contracts
Historic market growth of 15% per year based on median responses in this study.	Historic market growth not available
Future market growth of 10% per year based on median responses in this study.	Future market growth of 6.7% per year from 2017 to 2026.
If this market estimate grows at 6.7% per year to 2032, the final annual volume will be £426m. If this market estimate grows at 10% per year to 2032, the final annual volume will be £672m.	If this market estimate grows at 6.7% per year to 2032, the final annual volume will be £923m. If this market estimate grows at 10% per year to 2032, the final annual volume will be £1,458m.

[23] This assumes that drivers of the US market for energy performance contracts, such as the Federal buildings energy efficiency targets and the utility Demand Side Management Programmes have equivalent effects to the UK's central government carbon targets and the current public sector procurement frameworks.

There are significant uncertainties in these estimates. The Navigant proprietary methodology is not given in detail, while the methodology used for the market figure from this study suffers from:

- A lack of a reliable figure for total public sector investment in non-domestic energy efficiency service projects.
- A lack of data on commercial and industrial energy efficiency projects.
- No reliable benchmark factors for inflating the UK public sector figure to give the volume for the entire market.

In order to give context to the current UK market size, we took the end of the UK's Fifth Carbon Budget as a date by which significant energy savings should be delivered (39% from the 2032 baseline in non-residential consumption including industrial buildings). The BEES report also gives 39% as the current technical potential for energy efficiency in non-domestic buildings, with a required investment of £28.4bn. Assuming that the savings potential and cost-effectiveness of measures can be extrapolated into the future, this implies that to deliver the Fifth Carbon Budget, the overall investment will also be £28.4bn in today's money. If Navigant's market figure for 2017 is taken as the most reliable available to this study, (as it probably does capture all the public sector figures, plus those from the private sector), calculation shows that it would have to grow at a compound rate of 19.3% per year between 2017 and 2032. This would give a 2032 total market volume of £4.95bn of projects (at 2017 prices). As the £28.4bn total level of investment in buildings efficiency is anyway likely to be a significant underestimate of what will be required to deliver UK carbon budgets in all areas, it is clear that the efficiency services market needs to grow at a much higher rate than at present.

Given that the current UK market is strongly driven by public sector procurement frameworks rather than the private sector, it is expected that some form of further market intervention by the government will be required, at least in the early stages, in order to deliver this high level of growth.

Types of Energy Services Company in the UK Market

There is a significant difficulty in breaking down providers of energy efficiency services into sub-categories. Their reliance on expertise and relationships, rather than capital plant gives them flexibility to change, mix, or augment their business model to suit their clients. Companies recruited for this survey were categorised as being "Energy Services Companies", "Consultancies" or "Equipment suppliers",

based on their principal service offerings[24]. It should be noted that many consultants provide energy advisory services, but not the depth of support relevant to this study. The population of UK energy efficiency services providers that we identified has the following breakdown:

Table 7: Classification of companies in the UK offering energy efficiency services.

Type of Service Offered[25]	Number Found in the UK
ESCOs	32
ESCOs specifically offering EPCs	30
Equipment Suppliers	28
Consultants	46
TOTAL	**136**

The database also identified 14 organisations in the market who provide facilitation and intermediation, and 15 organisations who provide specialist finance.

Energy Efficiency Services and Technologies in the UK

Workshop discussions revealed that while clients approach ESCOs in order to gain access to innovative and complex solutions, what they are finally offered is often "Plain vanilla". This may reflect an aversion to risk amongst service providers, as well as an unwillingness to frighten clients away with over-ambitious proposals.

[24] Recruitment database based on membership, of the Energy Services and Technology Association (ESTA), a database of companies linked to the energy services sector previously prepared for BEIS by Databuild, direct web searches for key identifying terms for energy efficiency service providers and a list from BEIS based on previous work.

[25] ESCOs and EPC suppliers also included facilities management companies who offered these services as part of their integrated offerings.

Technologies such as LED lighting and Combined Heat and Power now appear to be well understood and are standard offerings in the market.

Workshop attendees also commented on the capability of some service providers to understand energy efficiency technologies and the interactions between complex systems.

As shown in Table 8 the providers interviewed in this study offered a range of energy services. Combined Heat and Power, LED / lighting systems and battery storage were cited as technologies seeing growth. One financier commented that there has been a significant increase in distributed generation and self-consumption. In addition, he indicated that there is a lot of focus on HVAC, but opportunities are not coming to completion, as they should.

ESCOs were the only group to mention Demand Side Response as a growth area. Smart meters, smart buildings and the internet of things were also mentioned by respondents in this category.

Lighting-as-a-service was not specifically mentioned in the workshops, while Pay for Performance was mentioned as an interesting new development.

Table 8: ESCO services and existing client projects

Market actor	Services offered
ESCOs (15 interviews)	Energy surveys/audits, energy configuration, energy planning and design, M&V, energy sensors, heat networks, Building Management Systems, lighting and lighting controls, HVAC and chiller replacement, boiler replacement, voltage optimisation, renewable energy including PV and solar thermal, energy management advice, installation of smart metering and monitoring equipment, local generation solution planning, utilities management, energy price risk and tariff management, regulatory compliance advice, energy strategy advice, Internet of things. Replacement of cold appliances, Energy cost planning, Supply of power and heat, Provision of investment funding, Remote energy monitoring and management bureau, Asset optimisation, management, maintenance and upgrades, Facilities management, Delivery of energy efficiency programmes, Carbon footprint reporting and compliance, Energy brokering and energy procurement risk management, Renewable energy strategies, Filling in funding applications for investment, Management of

Market actor	Services offered
	contract installation teams, Fully integrated energy services contracts, Digital aggregation of services, Grid connections
Consultancies (Five interviews)	Carbon management, Energy efficiency consultancy, Energy procurement, Energy management analysis and solutions, Energy audits, Energy procurement, Project management, Process advice, Energy management, Monitoring and reporting, Certification, Compliance, Energy training ISO500001, Software tools, Advice on acquisitions, Due diligence, Market research, Advice on investment.
Equipment suppliers (Six interviews)	Boiler controls; Instrumentation and metering; Software; Hardware to support energy efficiency projects for electricity providers, Power protection technology; Manufacturing and installation of heat interface units, metering and maintenance.
Finance providers (10 interviews)	Equity financing, debt raising, off balance sheet and operational loans, renewables PPAs, hire purchase, operating lease, general lease, bonds, large corporates, private placements, standard loans, counterparty loans, asset finance.

Profiles of Clients for Energy Efficiency Services

Annex 5 shows the sectors of the current customers of energy services providers who were interviewed. Given the small sample size, no patterns could be identified, other than a strong representation of the retail sector.

Nearly all ESCOs said their customer base included commercial clients, whilst seven said they had clients in the industrial sector. One specifically stated that they were mainly focused upon commercial and industrial work and one specifically concentrated on commercial clients.

Six out of 15 ESCOs said their clients were mainly public sector, whilst an additional two said their business was equally divided between public and private.

Identifying clients of energy efficiency services contracts through web research was difficult. We solved this by asking energy services companies for names of clients during their interviews. Because of commercial confidentiality, we were only able to contact nine clients as shown in Table 9 below:

Table 9: Clients who have energy services projects

Client type
Two local authorities.
A police authority.
A TV/cable/broadband company.
A retailer.
A retail property owner/operator.
A bank.
A private student accommodation provider.
A water company.

We were not able to identify any clients who used their facilities management contractor for implementing energy efficiency, nor were any of the clients interviewed from the industrial sector. The projects that clients had implemented were:

- Lighting projects paid for by installation fees (two respondents).
- Bureau service with carbon reporting and bill validation (two respondents).
- Initial site assessments and investment grade audits, (deciding on financing).
- Integrated energy management service including reporting, contracts, metering management, identifying savings opportunities, paid for by the customer.

- Investment grade audits of offices to identify and energy efficiency opportunities and building management systems for retail branches. The normal delivery chain of contractors was then used to implement changes with the company's own finance

Out of 31 ESCO clients mentioned in telephone interviews, 15 were in the public sector. Consultancies stated that out of 32 client types they served, 10 were in the public sector. Of the nine actual energy efficiency services clients interviewed during this study, three were public sector.

The Market Impact of a Bias Towards Larger Clients

In this survey, four ESCOs mentioned that they specifically targeted larger companies, with two ESCOs focusing on customers with an energy spend of over £1 million. Only one, a start-up energy services company, targeted SMEs.

Of the clients interviewed, all were all large organisations with significant energy spends. Where respondents were able to state their energy expenditure, three of the figures ranged from £5m to £20m per annum, two were in the range of £40m to 60m and one was £570m.

A sizeable proportion of the UK's non-domestic energy is consumed in fairly small parcels that have limited financial materiality for the billed organisations. Data from Ofgem and BEIS presented in Annex 1 of this report indicated that around 35% of non-domestic delivered energy is contained in bills of less than £107,000, and that around 38% (or 62,489GWh) is consumed in SMEs. This indicates that there is a severe problem with using energy services as they now operate to deliver savings for SMEs. Solving this could unlock around 26,900GWh of annual energy reductions[26].

Routes to Market and Strategies for Growth

Telephone interview results for the routes to market for different types of energy efficiency services providers showed no particular patterns. They used social media, client databases, exhibitions and public procurement processes, cross selling of energy services out of existing facilities management businesses, personal relationships, word of mouth and partnering with SME networks.

[26] The Buildings Energy Efficiency Survey indicates that 43% of buildings energy savings remain to be implemented amongst SMEs.

Customer respondents said that they had found out about energy services providers mainly through personal contacts, networking events and frameworks.

ESCOs and consultancies said that they have a number of approaches towards future growth, including increased marketing activity, acquisitions, moving staff closer to customers, cross-selling, joining procurement frameworks and partnerships with other organisations. The use of expanded product ranges was also cited as an approach, including Building Management Systems, Combined Heat and Power, data analytics, support to facilities management service providers, provision of finance, and through offering remote monitoring services. Changing their supply chain structure to cut out intermediaries was also mentioned.

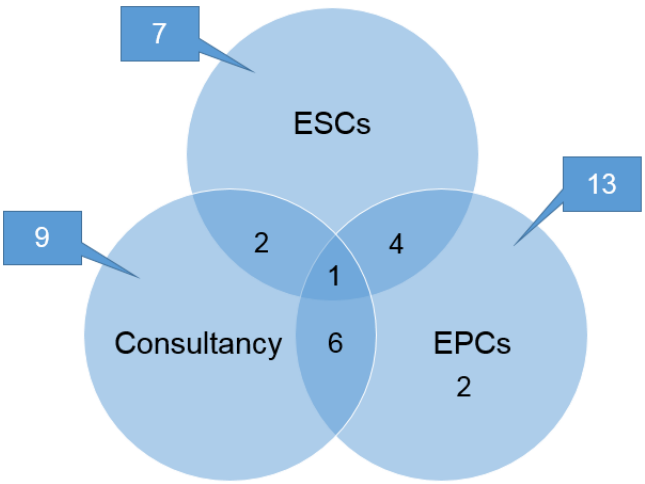
Equipment suppliers said that their future growth plans relied on awareness raising of retrofits. One also wanted to focus on advising construction contractors to think proactively about energy efficiency rather than as an afterthought.

Contractual Relationships, Finance and Risk Allocation

Common Contractual Relationships Offered by Service Providers

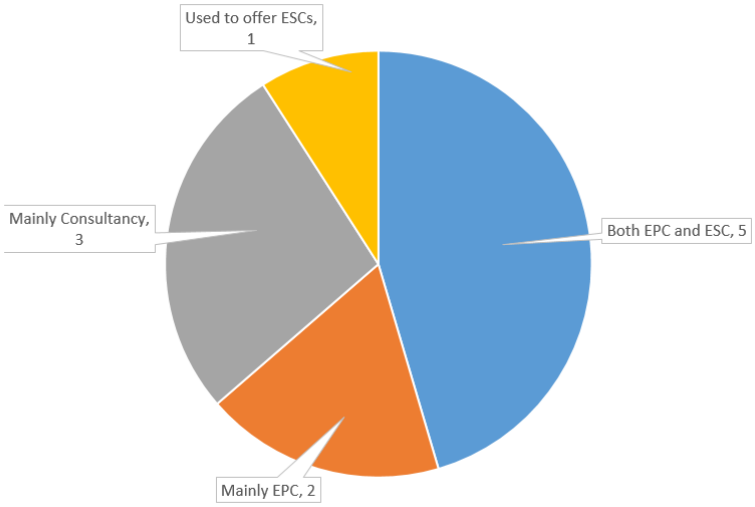
Figure 2 shows the combinations of contract types offered by the 15 ESCOs interviewed, showing that energy performance contracts are most frequently offered, followed by consulting contracts and energy supply contracts. There is a tendency for providers to offer several services.

Figure 2: Combinations of contract types offered by energy service providers interviewed.



In terms of contracts that are actually placed by ESCOs, the relative proportions between consulting contracts, energy efficiency performance contracts (EPCs) and energy supply contracts (ESCs) are shown in Figure 3. This shows that a large proportion of those who could answer offer both energy supply and energy efficiency performance contracts. A number of respondents were either unable or unwilling to give information on this.

Figure 3: Proportions of contract types offered by ESCOs interviewed.



Common Funding Mechanisms

Overall, the ESCOs interviewed as part of this research said there is no single way of financing energy efficiency projects, but that their customers frequently sourced funding themselves. This was corroborated by both clients and consultants. Fewer than half of the service providers provided finance themselves, and nine indicated that whoever organised the finance, third party sources were used. Only one ESCO respondent used special purpose vehicles to hold the project assets.

Funding mechanisms in the UK are generally in line with those offered in other markets and include capital loans, off balance sheet finance, operational loans, hire purchase, operating leases, general leases and bonds.

Rates of Return in Energy Efficiency Services Contracts

The ESCO correspondents in this study were not asked about threshold rates of return, due to time limitations for the interviews. One ESCO commented that in their opinion there were plenty of potential projects with attractive rates of return, but that

corporate inertia, risk aversion or sometimes issues of corporate strategy that held these back, not financial constraints[27].

Finance providers were asked about their target rates of return, and gave rates of between 3.5% and 12%.

Transfer of Risk in Energy Efficiency Services Contracts

Five of the 15 ESCOs interviewed keep the technical risk in relation to the project delivering the energy efficiency savings expected, while three stated that the customer takes the operating risk that they will use a certain amount of energy to make the project sustainable, including the risk that the baseline data is not correct.

Sometimes ESCOs use insurance to cover any shortfall against performance guarantees, while in other cases the service provider ensures that their costs are covered by the fixed fee, and only the shared savings profit is at risk. Three out of 15 ESCO respondents mentioned that client solvency risk is managed by funding providers.

Segmentation of the UK Energy Services Market

In order to efficiently target information on energy efficiency, non-domestic energy users have been divided into segments that would exhibit similar behaviours or which would require similar types of information. This process has often divided segment according to business activity or the technologies used for consuming energy.

Workshop attendees felt that while energy intensity was a key issue that was driven by technical processes, it was the capacity to take business decisions related to energy that was more important for the greatest number of companies.

Segmentation of energy efficiency services customers

Access to procurement frameworks, capacity to take decisions and the applicability of legislation are key for segmenting the client base (See Annex 6):

- Public sector organisations with access to energy services procurement frameworks that supporting implementation and financing of projects.
- Commercial property landlords: This sector is now unified by the impact of the Minimum Energy Efficiency Standards regulations for rented properties.

[27] The comment concerned a project with £120m of energy savings investments and a payback of two years that did not go ahead due to uncertainty over the continuation of occupation of UK sites.

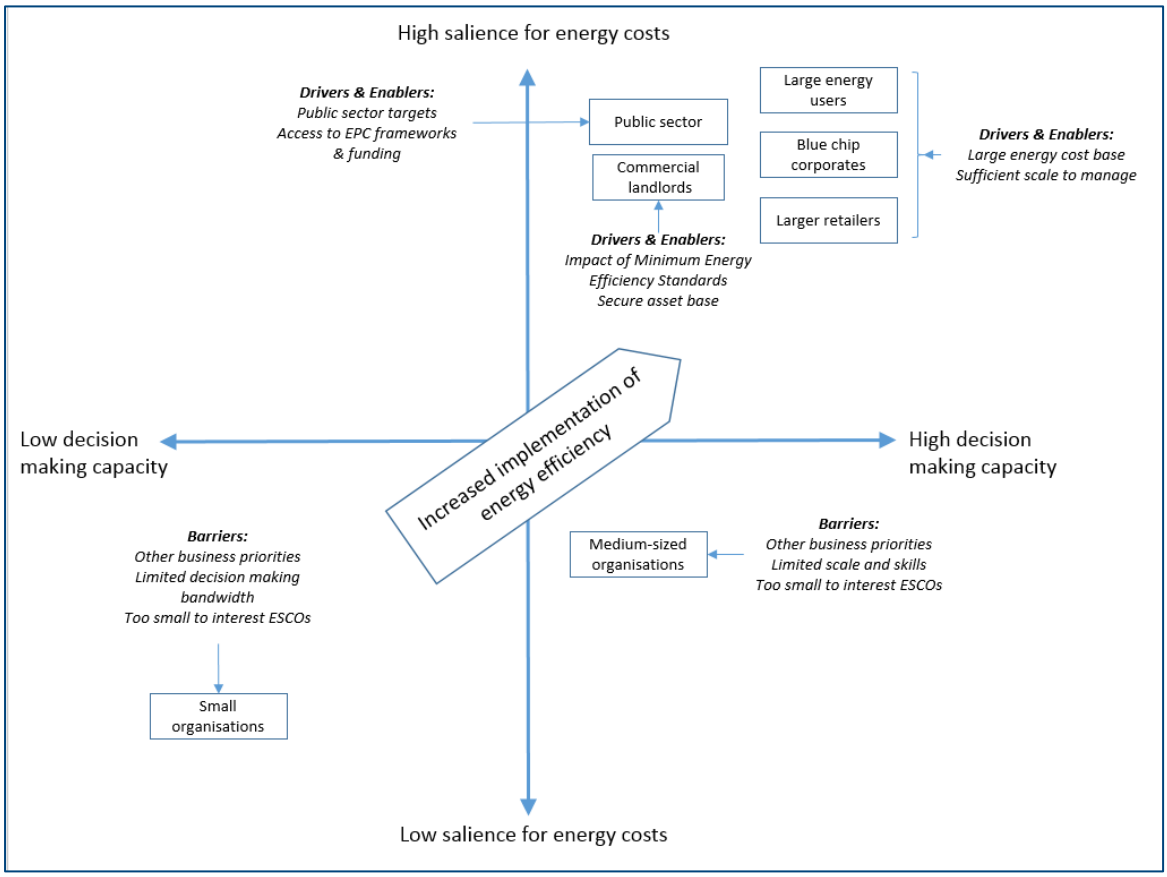
- Retail sector: The retail sector combines low margins, commonality of buildings energy technologies, similar decision-making processes and large scale.
- Large single site manufacturers and energy intensive companies: This group was a distinct and targetable group due to large energy bills, the concentration of energy onto few sites and more effective skills for identifying and managing opportunities.
- All other organisations: The capacity of an organisation to understand energy as a business issue is a key differentiator. Many organisations are very similar in how they consume energy, and energy represents only a small component of their core business. They are relatively homogeneous in their lack of understanding of the business opportunity from energy efficiency.

The overall situation is shown in the market map shown in Figure 4.

Segmentation of energy efficiency services providers suggested by workshop participants

The flexibility and rapidity with which the energy services sector evolves its offerings means that any interventions will potentially apply to all players. Facilities management, (FM), companies were identified as a segment that could usefully be targeted due to their access to clients and understanding of the service-type approach for delivering value to clients.

Figure 4: Energy efficiency services customer segment market map.



UK Market Drivers, Barriers and Enablers

Overview of Main Drivers and Barriers

The detailed results for telephone interviews of energy services providers, consultancies, financiers and equipment suppliers are given in Annex 7. Interviewees were prompted for key issues identified during the earlier desk research, but issues that they raised spontaneously were also identified.

The specific drivers and barriers were grouped thematically and the relative number of mentions are summarised below in Table 10. Note that this aggregation meant that it was no longer possible to discriminate between prompted and unprompted mentions in all cases.

Table 10: Market drivers ranked in order of frequency of mentions in interviews.

Driver	Relative importance (1 = most)	Examples of measures to address the issue
Cost reduction driver (including energy prices) (Prompted and unprompted)	1	Make cost reduction potential for EE and energy services more visible
Public policy driver (Prompted)	2	Stronger regulations and incentives
Public sector commitment driver (Prompted)	3	More public sector activity
Innovation in technology or finance driver (Prompted)	4	Support innovation in technology, finance and contracts
Corporate Social Responsibility / Carbon driver (Prompted and unprompted)	5	Make environmental improvements more easy for organisations to monetise
Energy resilience driver (Unprompted)	6	Incentivise resilience e.g. by encouraging on site generation.

Table 11: Market barriers ranked in order of frequency of mentions in interviews.

Barrier	Relative importance	Examples of measures to address the issue
Lack of trust barrier (Prompted and unprompted)	1	Improve quality of suppliers, give customers more information, publicise successes
Low priority for EE barrier (Prompted and unprompted)	2	Make efficiency more important to companies, improve credibility of EE, strengthen EE regulations
Financial returns barrier (Prompted and unprompted)	3	Reduce transaction costs, ensure transparency of risks
Split incentives barrier (Prompted)	4	Address landlord-tenant issues and ownership transfer barriers
Lack of corporate skills barrier (Unprompted)	5	Improve training and understanding of energy efficiency amongst client base
Difficulties with public sector procurement barrier (Prompted)	6	Streamline frameworks
Finding sufficient projects barrier (Prompted)	7	Increase awareness amongst clients and develop new routes to access service companies
Unavoidable business uncertainty barrier (Unprompted)	8	No measures possible
Lack of long term policy barrier (Unprompted)	9	Develop longer term policy roadmaps

Business interest in cost reduction and closely linked issue of energy prices were cited most frequently as strong drivers by all groups, as were public policies to stimulate the market and related issues such as incentives, emissions regulations, frameworks, public funds and public sector carbon commitments.

Perceptions of barriers differed slightly between the types of respondent. Market participants on the selling side of energy efficiency tended to cite the same barriers, especially a low client priority on energy efficiency, a lack of client trust in proposed solutions, and split incentives. ESCOs and consultancies mentioned lack of legislation and standardisation as barriers to clients understanding and trusting their offerings. Most equipment suppliers and financiers reported that market barriers did not differ between different sectors, technologies and projects. Only two respondents said there were differences.

Most respondents interviewed for this study have had projects that have fallen by the wayside. ESCOs reported that around 20% of projects fail to progress for reasons that include changes in personnel / ownership, a lack of budget, long paybacks, and procurement problems within the public sector.

Clients mentioned a process improvement trial that failed due to lack of specialist skills at the ESCO, and a solar project that failed due to falls in feed-in tariffs.

Detailed Discussion of Main Drivers and Barriers

The findings of the desk research and telephone interviews were discussed in the workshops and were consolidated into key themes for drivers and barriers. These do not necessarily follow the structure as had been identified in telephone interviews, as they reflect the outcomes of the face-to-face discussions.

Cost reduction is the strongest driver behind client interest in energy efficiency.

Cost reduction is now the strongest driver of the private sector market. Carbon has reduced in importance as an issue except for public-facing companies, who are now aligned with international climate change policy. For the public sector, the financial savings from energy efficiency are reinforcing the desire to achieve carbon reduction targets.

Public sector commitment to energy savings as a driver.

Telephone interviewees felt that public sector commitments to energy efficiency were a quite important driver. Workshop attendees particularly emphasised that stronger

public sector uptake of energy efficiency and energy services would help to build scale, develop local supply bases and would lead the private sector by example. While some ESCOs believe that the public sector is further along than the private sector, other point to difficulties with public sector procurement arrangements. One equipment supplier found the public sector harder to work with because they were less accountable for energy costs and have fewer incentives compared to the private sector.

Trust in the energy services concept is being damaged by poor quality.

ESCOs and customers of ESCOs both raised concerns over the quality of the ESCOs selling services into the UK market. Trust is a crucial issue in the ESCO marketplace. Trust has been damaged by poor quality ESCOs making over-ambitious claims for technical performance or failing to deliver on over-optimistic timescales. Customers mentioned a concern that ESCOs tend to cherry pick the easiest projects, which tied in with the lack of trust. In addition, a poor mismatch between the skills of energy auditors and the specialist processes that clients operate has damaged the technical credibility of energy services proposals.

Lack of salience for energy efficiency amongst organisations.

As energy efficiency is not a core issue for most businesses, decision makers frequently pay little attention to savings opportunities. This was seen to be a major issue. The Energy Savings Opportunities scheme has failed to turn this around and workshop attendees felt that compulsory implementation was required.

Regulatory inconsistency.

Customers have been exposed to a changing raft of energy efficiency legislation over the years, and this has led to cynicism in the marketplace. The announced closure of the CRC Energy Efficiency Scheme has caused concerns over long-term consistency. Organisations now tend to approach new initiatives with caution. Mention was also made of the present lower availability of detailed energy efficiency advice, including case studies, benchmarking guides and best practice guides that used to be available through government programmes.

Financial returns and availability of finance.

While telephone interviewees highlighted poor returns as a barrier, one said that these are sometimes used as a smokescreen to hide a lack of management interest in energy projects. The lack of finance was not raised as an unprompted issue during workshop discussions. High financial hurdle rates, combined with lack of

project scale and high transaction costs explains the lack of energy service provider focus on smaller companies. High transaction costs and project complexity were cited as barriers by ESCOs and financiers, while customers mentioned high monitoring and verification costs.

According to workshop attendees, opportunities need to be assembled into bundles of at least £1m to enable third party finance companies to cover them. Technology companies currently do this, but it is difficult to aggregate multi-measure projects.

It was highlighted that improved understanding of the energy services business model would help in reducing transaction costs. While standard templates might be of limited use, worked examples of contractual structures and mechanisms might be useful in helping companies to adapt their existing documents.

One ESCO with significant experience emphasised very strongly that the finance landscape had changed significantly since they had been in the market. Most clients eventually self-financed projects, instead of using finance providers. His organisation had moved to a model where payment was either on a consultancy basis by the client, or through a success fee from the equipment supplier.

Innovation in ESCO propositions, services and technologies.

In telephone interviews, equipment suppliers referenced innovation in technology as being a relatively strong driver for them, but while some ESCOs and consultants agreed, others felt that it was of lesser importance and two felt that it was not a driver at all. Financiers cited innovation in contractual mechanisms as an important driver. Feed in Tariffs and Renewable Heat Incentive were mentioned by three financiers, but only one financier mentioned Enhanced Capital Allowances.

Workshop attendees agreed that it was reduced cost that was driving uptake of new technologies, rather than any particular market appetite for innovation. The concern was also expressed that some ESCOs appear to not have the expertise to manage innovative or complex projects

Some ESCOs felt that there was a lack of expertise in the sector in selling energy efficiency. ESCOs fail to harness those co-benefits of energy efficiency that could significantly improve the business case, such as productivity and quality. Overall, it was felt that the sector tends to lack the commercial wrappers needed to sell services properly. One participant had solved this by selling efficiency services out of a core energy procurement-led business model.

Split incentives.

While split incentives between property owners and tenants were mentioned during telephone interviews, the workshops felt that these were being effectively dealt with by the Minimum Energy Efficiency Standards scheme. There was some concern as to whether current labelling gives sufficient detail on true energy costs and whether the long-term policy roadmap was clear enough to interact properly with the refurbishment cycle. This may be compounded by the trend towards shorter leases, which disincentivises deeper collaboration between landlords and tenants

The lack of understanding amongst clients of energy services.

Many stakeholders said that businesses often fail to understand the basics of energy services contracts and how energy performance can be incentivised and they mistrust the proposals made by energy services providers. However, one telephone respondent felt very strongly that this was not the case and that the biggest issue was the low salience of energy efficiency amongst businesses.

Lack of corporate skills to make decisions on energy efficiency.

Stakeholders felt that companies generally have poor decision-making capacity when it comes to energy efficiency. There was mention of the continued invisibility of energy efficiency savings in corporate accounts and ignorance of measures for valuing counterfactual savings. There is a lack of basic good practice information to help organisations with energy efficiency decision making. The lack of guidance to support these companies is much worse than it was in former years.

Workshop attendees felt that larger companies tend to feel that they have energy issues under control, even when they do not. In addition, risk aversion or lack of ambition inhibits them from considering that more transformative programmes could greatly increase efficiency, productivity and quality. This problem is underpinned by the disconnect between industrial process engineers and energy efficiency experts, which means that simple projects can fail to deliver their potential, or suffer from reputation-damaging underperformance.

Difficulties with public sector procurement.

Some comment was registered at the workshop that public sector frameworks can be over-bureaucratic and slow. One workshop attendee who was a client of a framework noted that despite the quality systems that the framework operates, he had received poor service from one ESCO. This was linked to a lack of technical understanding of the measures necessary in his facilities.

Lack of market volume.

Unsurprisingly workshop attendees tended to agree that they would like to see more market volume, even if this meant that further competition would emerge. They would value the reduction in intermittency of business that more opportunities would bring and the number of case studies that would become available to stimulate the market and grow confidence.

Workshop Views on Potential UK Market Enablers

The priority market enablers identified by interviewees are summarised in Table 12.

Table 12: Market enablers: relative mentions and improvement themes.

Issue	Relative number of mentions during interviews	Potential improvement measures
Improve trust	1	Provide quality framework for contractors, promote information on successful ESCO solutions, increase client understanding of contracts, risks and opportunities
Support to overcome financial hurdles	=2	Reduce transaction costs, assist development of projects, and provide assistance for smaller client types.
Standardised contracts and quality schemes	=2	Provide guidance on contract types and mechanisms, raise visibility of the delivery quality track records of ESCOs
More political support	=4	Provide visible engagement with and backing for energy services sector
Stimulate more projects	=4	Increase business drive for efficiency, increase awareness of services solution

Detailed Discussion of Potential UK Market Enablers

The workshop attendees added detail to these enabling themes:

Enabler 1: Increase the salience of energy efficiency.

Some form of obligation to implement ESOS was urged by many attendees. They recognized that compulsion would be politically difficult and wondered whether some form of positive investment incentive might be used as a softer approach. Alternative possibilities include modifying climate change agreements to drive more action or placing obligations on energy suppliers that would apply to non-domestic clients.

Enabler 2: Improve trust in the quality of ESCOs and energy consultants.

Although quality standards exist for service providers, the customer base is not necessarily aware of their value and is not asking for them. A code of practice for ESCOs would be useful, possibly based on the approach laid out in the Transparency initiative or the Investor Confidence Project. Alternatively, projects could be registered within a system similar to the UK's existing CHPQA scheme.

Enabler 3: Improve understanding of the benefits of energy efficiency.

It would benefit ESCOs and their clients if all could understand better the co-benefits that come with improved energy efficiency, particularly if process transformation is pursued. This would help ESCOs to develop better commercial wrappers for their services, and for customers to better appraise what they are being offered.

Enabler 4: Stronger public sector engagement should drive the market.

Faster uptake of energy efficiency services by the government sector would build sector capacity, be good for the public purse, lead by example and develop more case studies to build trust. Raising the standard of their own energy efficiency that suppliers must meet in order to qualify for government procurements was one suggestion raised. Another suggestion was to speed up the adoption by the public sector of energy efficiency performance contracts, as was raising the minimum efficiency standards for buildings rented by the public sector.

Enabler 5: Integrate energy efficiency and industrial process engineering.

Improve links between process experts and energy experts to develop process-specific efficiency knowledge and transform the energy intensity of industrial processes. Revisiting programme formats such as the Energy Efficiency Best

Practice Programme was another solution mentioned. Local energy efficiency networks could be used to stimulate dialogue between energy users and local technology suppliers.

Enabler 6: Subsidies for energy efficiency would not be a useful market enabler.

Workshop attendees felt that returns for energy efficiency projects are sufficiently good without adding incentives that would result in free-ridership; the issue of the salience of energy efficiency is the priority.

Potential Policy Recommendations

Selecting Policy and Intervention Options

Based on the findings on market drivers and barriers summarised in the previous section, policy options were chosen from amongst the examples found during the study of international best practice. Policy options were matched against the most important barriers and drivers and a long list of options was developed. The rationale for each is given in Annex 8.

- Promotion of standard contract terms, methods and guidance.
- Making available innovative methods for investment cost recovery.
- Stronger government adoption of EPCs to set an example.
- Stronger public procurement standards for energy efficiency of suppliers.
- Making available a national registry for energy services companies.
- Running UK local energy efficiency networks to raise awareness and skills.
- Setting up private sector procurement frameworks to facilitate contracts.
- Compulsory implementation of ESOS measures.
- Modifications to strengthen the Minimum Energy Efficiency Standards.

An attempt has been made to identify the role of government in kick starting, running and overseeing these initiatives. This issue will require careful consideration to ensure that each initiative is suitably positioned to benefit from appropriate levels of public sector resources and from the credibility that government involvement will bring. The policy options that are suggested are targeted at specific barriers and market enablers, and as the market grows some of them could ultimately become self-financing. However in the early stages, the associated initiatives are likely to require at least seedcorn funding to develop momentum and market interest.

Focus on Policy Options

Four policy and intervention options were discussed and chosen for further investigation to provide better information to policy makers. In Annex 8 these options were characterised according to six dimensions.

The options chosen were as follows:

Promotion of standardised ESCO contract terms, methods and guidance.

Energy services companies have indicated that they would find standard contract terms and guidance useful for selling the concept of the energy performance contract. The lack of client understanding of energy performance contracts is seen to be a barrier, but there are some indications that this is sometimes used as a smokescreen to hide lack of interest amongst client managers. Some further depth interviews are required to unpick this and to identify the likely market impact. In addition, the reason for a lack of awareness of existing UK guidance on energy services contracts must be identified.

Based on findings, the government could develop a library of standard terms and processes to assist energy services companies and clients in understanding how to adapt energy performance contracts to meet their individual circumstances.

The terms and processes should be designed to be suitable for insertion into the existing forms of contract with which companies are familiar, and should have guidance that will assist companies in using the standard terms to develop formats that suit their specific requirements. Suitable guidance should also help companies to understand proposals made to them, reducing asymmetry of information between them and services providers and potentially cutting transaction costs.

Existing UK and overseas templates that are already available online could be assessed, reworked, repositioned and remarketed as necessary. The cost of this option is likely to be low, of the order of £70,000-£100,000.

Outstanding questions:

- Why was current government guidance not referenced by respondents?
- Can foreign agencies inform the UK of the likely impact that better guidance can offer?
- What is the best format for guidance and how should it be promoted?

Innovative methods for investment cost recovery.

The market in the USA appears to be befitting from the C-PACE methodology for recovering investment costs via business property taxes, thereby circumventing the landlord-tenant divide and the divide between successive property owners. Similarly, on-bill finance methods, similar to those proposed for the UK's Non-Domestic Green Deal, are being rolled out. A comment was made by one respondent that the difficulties with the Green Deal may not be insurmountable, and that US states had taken several iterations to get their systems right. Consequently, the concept of innovative cost recovery should not be written off in the UK.

Direct contacts with agencies in the US could be pursued to identify the potential for a relaunch of the concept in the UK.

Outstanding questions:

- What is the real level of success of C-PACE and on-bill finance schemes in the USA?
- How is Pay for Performance ("P4P") really working in the US market?
- What factors are driving any successes in contrast to the UK experience?

Stronger government adoption of Energy Performance Contracts.

While the adoption of energy performance contracts in the public sector is now an important driver of the market, workshop attendees in this study indicate that they would like to see this process driven faster. Apart from boosting the market, this would also develop better statistics on the performance of services companies and more case studies to stimulate interest amongst potential private sector clients.

The UK's public procurement frameworks have proven successful at delivering net financial benefits to the public sector.

Potential approaches include setting tighter central government carbon targets, or offering funding bonuses for non-obligated public sector organisations to implement savings projects.

If the criteria for selecting projects were correctly set, the long term budgetary impacts of these options would be beneficial.

Outstanding questions:

- Would there be any unintended consequences of tightening targets and expanding the current procurement frameworks, such as reduced quality?
- Could the sector expand quickly enough to match the volume and quality needed?

Stronger public procurement standards for energy efficiency of suppliers.

Workshop attendees felt that setting higher energy efficiency standards for those wishing to supply into public tenders would give a useful boost to uptake of energy efficiency measures in the private sector. This could be a sliding scale of sophistication, based on the size of the bidder concerned, and could be progressively tightened over time to encourage continuous improvement. Basic requirements could be to have an energy policy, ranging up to proof of a simple energy management plan, proof of implementation of measures and proof of energy savings.

Such standards would allow suppliers to choose their preferred route for implementation, so would not be seen to be forcing them to choose the energy services approach where it was not appropriate.

There would be an ongoing cost to government to administer the additional procurement processes required to oversee this, but these might be recoverable in terms of reduced embedded energy costs in the supply chain over time. Similarly the costs to suppliers would almost certainly be negative due to the cost-effectiveness of savings measures.

Outstanding questions:

- What would be the response of industry and commerce to stricter standards?
- How could requirements be structured to ensure that suppliers always received a net benefit?
- Is there a strong enough business case at the national budgetary level for justifying tighter supplier standards?

National registry for energy services companies.

The negative impact on client confidence from inconsistent and poor quality amongst energy service providers was raised as a significant issue. Comments from one client indicated that even existing public sector procurement frameworks contain vetted contractors who are not suited for some forms of work. Further information on

this issue would be useful both for exploring this intervention option and for assisting existing public sector frameworks to improve their practices.

Overseas agencies could be directly interviewed by BEIS to inform decision-making, including ministries in Italy, the United States industry association (NAESCO). There are also industry led initiatives which have received EU Horizon 2020 funding to develop standardisation in the market - the QualitEE project and the Investor Confidence Project.

Based on findings, a national registry for energy services companies could be set up, modelled on similar systems used overseas, providing some form of quality assurance for potential clients. Several approaches have been implemented overseas, and the UK also has the example of its own CHPQA scheme. The costs of a similar scheme for energy services contracts is likely to be of the same order of those of the CHPQA scheme.

Outstanding questions:

- What experiences have overseas agencies had when implementing service provider registries and quality schemes?
- What is the most suitable format for the UK – registering projects and project performances or accrediting individual service providers?
- How can a quality scheme be operated so as not to erect barriers to market entrants?
- To what extent would promoting existing schemes such as ICP28 fulfil the need?
- What would the operational costs of a scheme be, and could it become self-supporting?

Energy efficiency networks to boost demand for improved energy efficiency.

Develop UK energy efficiency networks similar to those that have proven successful in Germany, Switzerland and Ireland. Networks would link companies together and provide them with centrally designed approaches to saving energy.

The energy efficiency networks intervention is potentially expensive, but could also have a significant impact on national energy efficiency. It would not necessarily bias activity in favour of energy services solutions, but it is acknowledged by stakeholders

[28] Investor Confidence Project

that such a stimulation to the market would be to the common benefit. Providing energy services companies with access to the networks and providing independent advisory support in developing EPCs could be a core element of the approach.

It is recommended that BEIS contact the German national energy agency, DENA and obtain detailed information on the methods and costs behind their scheme. The benefits to SMEs are being measured, and this would be valuable for building support for this intervention option. In addition, BEIS should be able to view impact assessment information on the Waste Minimisation Clubs initiative that was jointly sponsored by the then DTI and DEFRA in the 1990s. This data would greatly assist BEIS in identifying reliable levels of costs and benefits for the intervention.

Likely costs would be large, with a full network programme probably having a self-financed budget in the region of £5m-£10m[29]. Early pilot stages would probably require significant government funding, possibly around £1m-£2m per year, before the programme became self-sufficient.

Outstanding questions:

- What are the impacts of local energy efficiency networks, particularly for SMEs?
- What are the likely costs of the networks? To what extent can they become self-funding?
- How can efficiency networks be harmonised with other interventions and policies, such as climate change agreements?

Private sector procurement frameworks.

The public procurement frameworks operating in the UK were felt by interviewees and workshop attendees be very successful and to have significantly raised the volume of work in the sector.

While exact replicas of the existing public sector frameworks would not be possible, one way of delivering some of the benefits would be by providing private companies with access to the performance and delivery records of ESCOs on the existing frameworks. Alternatively, private sector companies could benefit from access to the facilitation services provided by the existing frameworks. Alternatively, private sector facilitation could be provided via the UK's trade association, or kick-started in the

[29] Based on telephone discussion between IPA Advisory and DENA, 2018.

private sector to provide a service offering similar to that used (by the public sector) in Denmark.

If some aspects of the existing public sector frameworks are extended and made available to private sector clients, the costs for a regional pilot would probably be in the region of a few £100k. If a larger roll-out is feasible, it is possible that registration fees could be used to make the programme at least partly self-funding.

Outstanding questions:

- To what extent can elements of existing private sector procurement frameworks be legally opened up to potential private sector clients?
- Which elements of the frameworks would be most useful?
- Would the elements made available be based out of the existing frameworks, or would new entirely private sector frameworks need to be set up?
- What would the marginal costs be for clients and their service providers?

Conclusions and Next Steps

Conclusions

Previous work by BEIS has shown that the UK still has a significant backlog of viable unimplemented non-domestic energy efficiency opportunities[30][31], constituting a classic "Energy efficiency gap". Many of the organisations who need to act to make these savings do not have the capacity to support in-house energy management functions. This means that the energy efficiency services sector is potentially an important alternative mechanism for delivering the backlog of savings.

The UK's energy efficiency services sector is large in absolute terms, but is relatively smaller than those of similar nations. There are signs however that the UK market is catching up, with steady recent growth being matched by relatively optimistic assumptions amongst stakeholders that future growth will also be good.

There is limited information publicly available on the number and scale of energy efficiency services contracts in the UK, but a proprietary survey by Navigant indicates a 2017 market volume of around £349m.

Recent UK growth in efficiency services contracts has been strongly driven by central government carbon saving targets, combined with the facilitation services provided by public sector procurement frameworks such as Re:fit. This experience is similar to that of other nations such as the USA, who have put in place strong targets for energy savings in federal buildings.

Now that the UK has a solid pipeline of public sector energy saving projects, two questions emerge:

- How can public sector uptake of energy efficiency projects be driven even faster?
- How can the energy efficiency services capacity that has been developed be applied to deliver savings in the private sector?

[30] The Building Energy Efficiency Survey of 2016 showed that savings of £1.3bn with attractive paybacks (<3 years) remain for UK buildings

[31] "Business Awareness and Uptake of Energy Audits" of 2017 shows that even the key first step of an energy audit has limited uptake; 30% of organisations with between 500 and 999 employees have not had an audit and the fraction increases to 58% for those with 50-249 employees and to 77% for those with 10-49 employees.

The government is consulting on voluntary public sector carbon targets, which would be likely to have a strong effect to increase efficiency uptake in non-central government public buildings.

When consulted in this study, service providers indicated that a lack of trust amongst potential private sector clients is the main barrier that they face and that this is being underpinned by variable quality and a lack of specialist skills amongst some service providers. They also feel that there is a lack of salience for energy savings amongst prospective clients, and that ESOS has failed to turn this lack of interest around. They also experience barriers associated with low financial returns, (linked to high transaction costs and high costs of capital). Despite the recent introduction of the Minimum Energy Efficiency Standards for commercial rented properties, respondents feel that split incentives between landlords and tenants are still a problem. Poor corporate decision making on energy efficiency was also an issue.

For those firms who take on board services contracts, providers felt that their strongest motivation came from energy cost savings and that carbon was now only of concern to larger customer-facing organisations. Public policy was the next strongest driver, followed by public sector commitment. Innovation in technology and finance was seen to be a driver only insofar that they reduced transaction costs and the cost of equipment and improved performance.

Service providers wanted to see more action to help improve the levels of client trust in their solution, such as quality schemes and standardised contract terms. They wanted to see measures that would reduce financial hurdles and they wanted the government to give more visible political support and to stimulate more projects to come onto the market.

Based on international research, a number of initiatives were identified that could potentially assist the UK sector:

- Promotion of standard UK contract terms, methods and guidance.
- Making available innovative methods for investment cost recovery.
- Stronger government adoption of EPCs to set an example.
- Stronger public procurement standards for energy efficiency of suppliers.
- Making available a national registry for energy services companies.
- Running UK local energy efficiency networks to raise awareness and skills.

- Setting up private sector procurement frameworks to facilitate contracts.

Defining the role of government in any of these interventions will be important. Workshop attendees emphasised the role of government in setting a good example by adopting energy efficiency services even more strongly and promoting them within the public procurement supply chain. They also stated strongly that government has a vital role in providing a visibly impartial quality monitoring function within the industry. While such a function may be outsourced and even eventually become self-financing, workshop attendees felt that government would still need to oversee and monito quality and governance.

In addition, it was clear that some interventions that would become self-financing and potentially independent of government would require initial support to set them up and take them to a point of being viable models that would be attractive to business operators. Examples of interventions in this category include the national registry for energy services companies, local energy efficiency networks and private sector procurement frameworks.

Recommended Next Steps

A number of next steps are recommended in order to address some of the issues identified in this study, identified in Annex 9, and to further explore potential market interventions. While several of these may ultimately become led by the private sector, for many of them public sector support is vital, at least in the early stages. In some cases, this may be because the early stage risk is not compatible with private sector business finance, or because the sector feels that the impartiality of government is necessary to give credibility to the suggested initiative.

Continued dialogue with energy services providers.

The attendees at the workshops indicated their strong interest in continued involvement with BEIS policy development in this area. It is recommended that this report be used to promote this dialogue, and that BEIS should work with the Energy Services and Technologies Association on further consultations.

Continued monitoring of the UK energy services market.

There is no ongoing monitoring of the UK market for energy efficiency services, and there is even a lack of publicly available information on the numbers and volumes of projects let within public frameworks, such as Re:fit. It is recommended that BEIS should take a coordinating role in gathering the necessary data. A regular cycle of data collection would raise awareness of the sorts of information that BEIS requires, would improve measurement of policy impact and would uncover areas of the market that a one-off survey cannot easily penetrate.

Investigate the level of guidance currently available on energy efficiency

Consultees within this study mentioned that they feel that there is considerably less information available to help companies to understand energy efficiency than was the case 15 years ago. They felt that this lack of detailed manufacturing information linked to energy efficiency is holding back the development of new industrial processes that could transform energy intensity, quality and safety. This issue needs to be explored with manufacturing trade associations, because these high value-added low carbon processes are also aligned with the UK's industrial development goals.

Work with other policy owners to raise the salience of energy efficiency to businesses.

Policies that affect the energy services sector interact with those of many other areas of government. Workshop attendees gave strong guidance concerning the lack of interest in energy efficiency amongst businesses that leaves many good opportunities unimplemented. It was acknowledged that compulsion to implement measures, within for example the ESOS scheme, might not be viable on its own, but it was felt that some form of voluntary commitment linked to an incentive scheme could help to address this. Making such a scheme successful would require significant interdepartmental cooperation. Exploration of experiences in other nations would assist in kick starting this process. The German scheme for auctioning government investment funds for energy savings projects is one example that might offer useful insights.

Carry out further research into potential intervention options.

Of the intervention options suggested in this study, there are outstanding areas that further research would be needed as follows:

- Promotion of standardised ESCO contract terms, methods and guidance.

- Making available innovative methods for investment cost recovery.
- Stronger government adoption of Energy Performance Contracts.
- Stronger public procurement standards for energy efficiency of suppliers.
- A National Registry for Energy Services Companies.
- Energy Efficiency Networks.
- Private Sector Frameworks for Supporting Procurement of Performance Contracts.

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