



Energy Performance Contracts (EPCs) – How to make them a success and avoid common pitfalls

The Council of the European Union (2012) identifies EPCs as a potential solution to energy challenges. In simple terms, an EPC is a binding agreement between the customer/end-user and the ESCO (energy service company) to apply energy saving measures to their facility which will reduce energy usage, emissions and operational costs. This agreement is guaranteed at the risk of the ESCO, which means that the ESCO takes over the entire performance and design risk. EPCs are a form of ‘creative financing’ for improving buildings and getting the most of organisations upcoming capital projects by combining energy efficiency.

The ESCO designs, calculates and implements the energy savings measures and contractually guarantees the financial and energy savings (and sequentially CO₂ savings). This is done through energy reduction measures and optimised assets such as the building plant (lighting, heating, ventilation and air-conditioning equipment). The ESCO justifies and monitors the said savings throughout the duration of the payback of the contract, therefore in effect the annual savings from implementing the EPC will reimburse the loan required to deliver the project works.

The use of EPCs has been growing in the UK mainly in the public sector organisations over the last few years. EPCs have been delivered across a range of buildings including NHS, schools, local authorities and other public buildings and its popularity

is mainly due to the award winning programme RE:FIT. RE:FIT is part of the London Mayor’s £34 million Energy for Londoners programme, and its aim is to make non-domestic public buildings and assets more energy efficient. I have been lucky enough to work with RE:FIT both while in Hammersmith and Fulham Council and Bank of England. I have worked with different contractors under the framework and used the framework to improve different types of buildings and assets. I have been able to experience first-hand the main issues, risks and opportunities and how to successfully drive and implement such contract and take advantage of the benefits of the framework.

A few months ago I was invited to take part in a research project on EPCs, with particular focus on the concerns and hesitations from an end user perspective in implementing the contract as I have successfully implemented EPC (specifically RE:FIT) and worked closely with different ESCOs. The research was carried out by Patrick Doyle as part of his Master’s degree; MSc Project Management “Construction” at London South Bank University. Patrick and I worked closely during roll-out of the RE:FIT framework for the Bank of England. One of the interview questions was about the popularity of the EPC contracts and I found out that contracts like these have been around since the 1970’s and 80’s in the US as a result of the “energy crisis”. This is often referred to as the first generation of energy performance contracting. I could not help but wonder why they have not been so popular in the UK,

taking into account their offering as well as the Climate Change Act and the Government’s commitment for emissions reduction. For me and energy managers alike, EPCs are a no-brainer, they offer cost and carbon savings –which are guaranteed, there is no risk involved, low interest financing (although not widely known) exists, and they provide a great opportunity to get capital, maintenance, finance team as well as energy managers working together and learning from some of the best energy service providers and engineers in the field. On the other hand, I have many times experienced first-hand the concerns and scepticism involved in such arrangements from the end-user side and it comes down to:

- The difficulty of understanding the commercial model probably due to lack of relevant communication and success stories out there;
- The lack of relevant legislation and regulation to commit an organisation to save energy and carbon. Although the new Minimum Energy Efficiency Standards (MEES) has made a small difference, others such as ESOS or CRC stopped short of enforcing changes and improvements for energy and carbon reductions.

From the ESCO point of view following the research, the main barriers to organisations successfully implementing EPC are:

- The inability to access low interest finance or completion with other capital works funds;
- The co-ordination between the capital/FM and energy teams so that vital lifecycle equipment can



be scheduled to be replaced with the most energy efficient solutions;

- The lack of in-house technical assurance and skills available on the end-user side.

Patrick and I have tried to help by breaking down the process and addressing common issues which will arise in each stage and bringing in solutions and findings from the research project.

weekend works, etc.). Monitoring is constantly carried out by the ESCO for the duration of the payback and most commonly a report will be delivered annually until the required payback is achieved.

Below, we have tried to explain what each stage includes and the main recommendation of overcoming issues that may arise in each stage.

Initial Desktop Assessment/ High Level Agreement (DTA or HLA)

Although this is only a first and very short stage, it is key for the organisation as an end-user and the main stakeholders from within the organisation to understand how a project like this will be procured and financed. Even in this initial stage, it is quite important to start a conversation with the internal stakeholders in the organisation who will be signing off the project and start 'educating' the organisation about EPCs. In addition building managers and site engineers should be involved as their site specific knowledge will be helpful to the ESCO. It is also quite important to think and define requirements (e.g. cost saving, CO2 reduction, payback). These will be set at this stage and they need to be realistic and achievable as it is quite common that during the Investment Grade Proposal Stage (IGP) these will need to be met by the chosen contractor/ ESCO. At this stage, some of the information the EPC contractor(s) would usually look to attain will include energy data, plant/asset lists, relevant drawings and any planned

lifecycle or capital projects (as they could be incorporated under the EPC). It is therefore quite important that they are accurate and up-to-date but you will have the opportunity to review these during the IGP stage.

Once this information is assessed, the site's energy baseline can be generated and the contractor can complete high level scoping surveys with knowledge of the site's most energy intensive equipment and areas. Under some of the frameworks and subject to receiving all of the required information from the end-user the HLA can be completed within 20 working days.

It is at this stage that the preferred funding route should be chosen, whether it is the capex, or a low interest third party funding.

Tender

If you have taken the RE:FIT route then the tender process becomes much easier and shorter, and therefore huge resourcing from end-user side is not necessary when compared to an OJEU based tender. The RE:FIT framework is already a competitively tendered and OJEU-advertised framework. In addition, the Programme Delivery Unit (PDU) is there to provide expert free support for the end-user during the whole process. Up to this stage the process is usually free and the main cost involved is staff time.

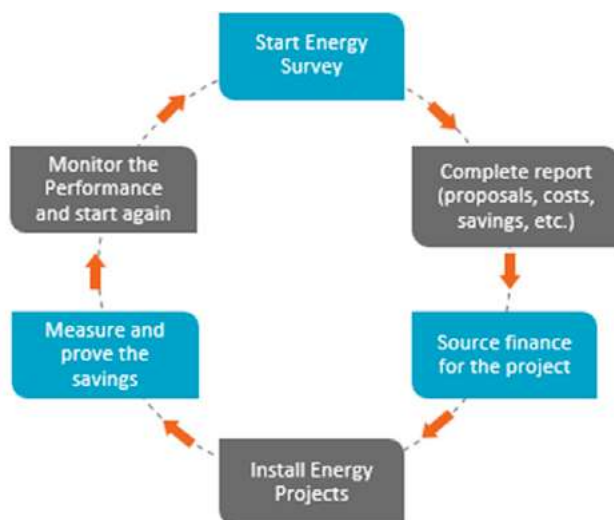
The end-user usually provides a maximum budget, desired payback and carbon targets and if they want any energy measures in particular to be included or disregarded prior to the offerings being submitted, the ESCO can come up with the best scope of works to achieve these criteria.

When looking at the different proposals from the interested contractors you need to remember that what the bidder is presenting is in most cases based on what was discussed or defined during the initial stage. There will be different options for energy conservation measures

Key stages and how to overcome issues

Although there are a number of different EPC types of framework, RE:FIT for non-domestic public buildings, Essentia Trading Ltd, for NHS Trusts and other public buildings and Carbon Efficiency Fund, to name a few they would all follow the same stages:

- Initial Desktop Assessment/ High Level Agreement (DTA or HLA) – 20 working days;
- Tender – typically 2-6weeks depending on end-user;
- Investment Grade Proposal (IGP) – 60 to 90 working days depending on level of scope;
- Contract and Energy Conservation Measures (ECMs) – up to 60 working days depending on the contract complexity and the end-user's legal capabilities (in-house or contracted);
- Service delivery/monitoring stage – the delivery is typically flexible and specified by the end-user, particularly due to site requirements (night time,



and commonly low cost measures will have a quicker payback where more innovative solutions may have higher costs and longer paybacks but great carbon reduction potential. You need to be clear if you want the bidders to be innovative, consider renewable options and other new technologies or just upgrading of your existing assets.

One of the main difficulties here for the ESCO is the false perceptions of paybacks. It is believed that certain technologies such as lighting upgrades for example can achieve a payback within 2 or 3 years. This is rarely the case. When suppliers provide these high-level quotes, they are usually just taking into account the equipment cost, not labour, access and associated costs. Thus, often the end-user's expectations can be unrealistic and the ESCO have to justify this and manage expectations.

Investment Grade Proposal (IGP)

The IGP is prepared and produced by the ESCO and includes details of Energy Conservation Measures (ECMs) to be installed, the guaranteed savings, tonnes of CO2 saved a year, capital costs, payback periods as well as the details of the Measuring and Verification (M&V) plan of how the guarantee savings will be realised. Energy audits, comprehensive analysis of energy data as well as energy tariffs are the key components of this stage. It is common that the scope may also change as this process so far may

have highlighted upcoming capital projects. At this stage involvement of key stakeholders is crucial again. People on the ground looking after the buildings will need to provide a lot of information and in some cases the information is non-existent. When the ESCO team gets to site they can be met with varying attitudes depending on the position and individual site. Sometimes the O&M team can welcome the EPC works and understand that it will benefit their site, however other times the ESCO can be met with cynicism as the site based team can be somewhat protective of their site, how they run, operate and maintain the building, etc.

Whereas the in-house energy managers are typically positive with the EPC, as it will aid in achieving energy and carbon targets, especially if the organisation has committed to carbon reduction targets, it is common that collaboration and information sharing between ESCO and in-house teams can be difficult and not transparent. As part of the in-depth investigation and analysis, the ESCO may uncover and raise issues with the site M&E infrastructure that they should have already known about or may need information and documents that do not exist. The role of the in-house energy manager and the support of the main advocates in the organisation of the EPC are key to iron out any difficulties in this stage, especially if the maintenance contract is outsourced.

The IGP is usually charged at a small fee but if the EPC goes to the next stage of contract and implementation it can form a part of the total cost of the project. The IGP stage incurs a fee as it is usually at this stage that the decision is taken not to proceed to deliver the works. This may be due to a variety of reasons, such as uncertainty around the future use of the building or finance routes. By charging the fee, the ESCO is able to recover some of the cost invested in the project so far, but the fee often does not cover the time spend on the project up to that point.

Contract and Energy Conservation Measures

Once the first three phases are complete the next steps should be generally pain free, depending on the bureaucracy inside the organisation and how much engagement and communication has taken place up to this point.

The ESCO can be appointed under the implementation contract. A legal representative needs to be appointed early enough to give them time to understand the model and the scope. If the EPC is being delivered through a framework, for instance RE:FIT, there can be additional support provided to the end-user from the Programme Delivery Unit (PDU) which can help mitigate resource issues if applicable.

It is recommended to plan frequent meetings with all the right stakeholders from both end-user and ESCO during this stage. The meeting structure may depend on the delivery contract used (JCT or NEC) as project updates can be via bi-weekly or monthly project meetings and/or regular programme updates. The meetings and updates will also vary depending on the site, its challenges and sensitivities:

- Educational facilities: timescales and programme based out of hours and holiday period,
- NHS/Healthcare: night time works and maybe back of house focused projects,
- Commercial buildings: weekends and out of hour works, etc.



SHORT ENERGY MANAGEMENT TRAINING COURSES

FUNDAMENTALS OF ENERGY MANAGEMENT-ENERGY AUDITING-PROCUREMENT-MONITORING, TARGETING & VALIDATION-HVAC CONTROL & OPTIMISATION-WATER MANAGEMENT-BEHAVIOURAL CHANGE-ONSITE GENERATION-LIGHTING-DATA-BUILDING SERVICES-BATTERY STORAGE-STRATEGY AND MORE

WWW.THEEMA.ORG.UK - 0203 1762834 - ENQUIRIES@THEEMA.ORG.UK

It is quite common that during this stage the end-user may decide to bring different consultants in to review technical information and calculations of the project. If this is the case, then roles and responsibilities between ESCO and consultants need to be clear and it is suggested that consultants may be involved to check legality and contractual arrangements and ensure all guarantees, savings and targets are adhered.

Keep in mind that as part of the EPC the ESCO has the responsibility to produce all of the designs and engineering at their risk and guarantees the savings. Bringing in third-party to review these may prolong the contract start date, installation and therefore the start of the benefits realisation.

Service deliver/ monitoring stage

As energy and carbon savings are key to these type contracts, these will be realised during the delivery stage once installation of all ECMs is complete. You may have the added complexity here of having an energy part and a lifecycle part as part of your EPC. This should be outlined in your IGP in a format that should be clear to everyone.

There is often scientism at the measurement and verification (M&V) and reporting stage. However, all M&V reports and calculations are carried out by an internationally recognised protocol known as the International Performance Measurement and Verification Protocol (IPMVP).

IPMVP lays out how calculations should be carried out and calculated, lists what has to be taken into

account and even allows for adjustments with such factors as outdoor air temperature and changes in occupancy (both increase and decrease to ensure fair and unbiased reporting, savings and guarantees. Most ESCOs will have online M&V platforms to ensure clarity and ease of reporting.

These reports will be issued to the end-user annually or biannually, but the ESCO will be constantly monitoring the energy data for any fluctuations or irregularity regarding the energy use and will raise this with the end-user as and when it is an issue. Some of the savings will be realised really quickly and some will take longer. The Energy Manager should be a crucial part of this stage and in some cases (for example under RE:FIT), free training on IPMVP is offered for stakeholders on the end-user side.

Conclusion

From our hands-on experience and academic research into the topic, findings indicate that the uncertainty concerning the EPC model is predominantly as a result of many having a distorted and flawed understanding of the model.

Nevertheless, there are some cases where the site process, complications with tenancies and/or uncertainty of a building's future justifies the end-user's reluctance to consider implementing the EPC model.

For issues regarding capex there are many routes to low interest loans for renewable and efficiency projects; with scepticism concerning the guarantees there are contracts put in place to ensure that these savings, guarantees and paybacks are binding

at the risk of the ESCO; there seems to be concerns regarding the M&V but as aforementioned it will be produced following an internationally standardised protocol.

To conclude it is widely known through the energy industry that EPCs meet many site challenges and are considered as low-risk high-reward agreements.

In the vast majority of cases the use of the EPC model for the associated direct and non-direct benefits is viable and the advantages greatly overshadow the drawbacks. It offers a great way to reduce organisations' environmental impact and cost and this can be done at minimum risk to you as an end-user.

Author's profiles:

Vassia has over 10 years' experience in energy management and delivering sustainability and environmental programmes for organisations with complicated estate portfolio across the private and public sector. As the in-house expert, she helped to reduce carbon emissions, deliver energy and financial savings as well as developed and implemented a number of large and complicated projects including capital, renewable installations and behaviour change.

Patrick studied Facilities and Energy Management in Ireland and have just completed a Master's Degree in Construction Project Management. With 5 years in industry, he worked in Ireland as a Domestic Energy Advisor before joining Bouygues Energies & Services graduate programme, and gaining a position in the Energy Engineering team.