

Energy Performance Contracting Requires Careful Procurement

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Abstract

Energy performance contracting (EPC) is a mechanism, which opens up opportunities for building owners to install more energy-efficient equipment and systems in their buildings without tying up their own capital. Energy savings by 20 to 40 per cent and market increase of up to ten times is within reach. This could contribute to important reduction of the emissions of greenhouse gases. EPC - sometimes also named Third Party Financing (TPF) - includes lower financial burden for the building owner and reduced yearly operation costs for energy. Better performance is guaranteed by the contractor – the energy service company (ESCO).

Keywords

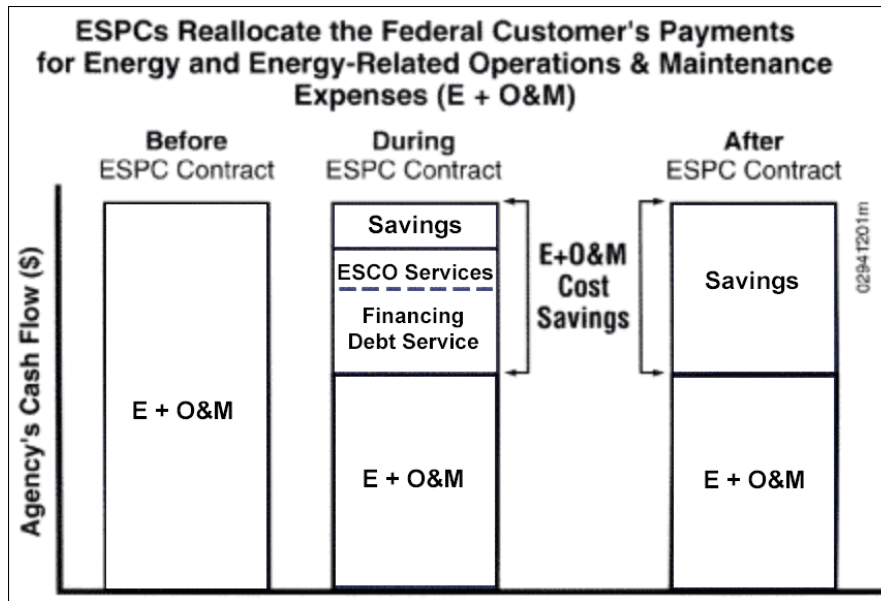
Performance Contracting, Third-Party Financing, Energy-efficiency, Procurement. ESCO

1. Background

Task X "Performance Contracting" is one of the tasks within the International Energy Agency (IEA) Demand-Side Management (DSM) Implementing Agreement (Westling, 2003). Eight countries are participating in Task X. The objectives of the Task are to facilitate the greater use of performance contracts between professional building owners and all types of companies offering these services. With the deregulation of the energy markets, more international trade will develop. Within the joint multinational IEA project, varying energy and institutional situations have been compared as a background for suggested actions to increase the use of and expand the international market for EPC.

2. The EPC Mechanism

Energy service contracting, or *energy performance contracting (EPC)*, is an established range of mechanisms for promoting the installation of energy-efficient building equipment and systems. Facility owners and *energy service contractors, or ESCOs*, enter into agreements to perform retrofit installations of equipment that can save money on building operations. The savings in energy bills due to the more efficient equipment are shared between the facility owner and the ESCO under the terms of the agreement. Most importantly, the ESCO can take on the project's performance risk by guaranteeing a specified level of energy savings. The ESCO's compensation can then be directly tied to achieving these savings. The financing can either be by the ESCO, by the suppliers of the system or components, by financial institutions, or by an outside party – or in different combinations. The situation before, during and after an *EPC contract arrangement* is illustrated in [Figure 1](#). The cost of energy (E) + operation (O) and maintenance (M) is illustrated *before* a contract, *during* a contract, when the total savings are used for financing and debt service of the new equipment and the remainder shared by the owner and the ESCO, and *after* the contract when the total savings go to the owner. EPC is a mechanism that introduces "*payment in relation to performance*". Different problems and barriers have slowed the introduction and wider spread of this method.



**Figure 1: Illustration of cash flow for EPC (or ESPC) contract
(Source: FEMP, 2001)**

3. Motives

There may be different motives for choosing a performance contract or other ESCO financial arrangements:

- For some facility owners and users, the main reason can be lack of investment capital.
- For others, it is simply a very economical business strategy. We pay only when we see value-added functions, such as reduced energy bills.
- For the ESCOs, it can be a good business argument and a way of connecting with customers and starting new business relations.
- For some companies and government organisations, it can be a very efficient way of inspiring innovations, giving incentives and facilitating the introduction of more efficient solutions.

4. Definitions

Energy Performance Contracting (EPC) is a contractual agreement for the obligations of owner and ESCO, where refurbishment of energy equipment and systems in buildings is paid for in relation to actual performance.

An *Energy Service Company (ESCO)* is defined as a company engaged in developing, installing and financing comprehensive, performance-based facility improvement projects, typically 7-10 years in duration, centred around improving the energy efficiency and reducing maintenance costs for facilities owned or operated by customers (NAESCO, 1997).

Energy savings performance contract (ESPC) means a contract between the host facility and the ESCO for a performance-based energy efficiency retrofit (FEMP, 2001).

The *performance criteria* will mainly refer to the use of energy, including resulting costs and change of energy source, but could also include other aspects, such as better indoor air quality or offer of services.

Other definitions include *BAFO*, which means **best and final offer**, *ESG*, which means **energy savings guarantee**, and *PQD*, which means **pre-qualification documentation**.

5. Types of ESCOs and Services Offered

There are different types of ESCOs. Most countries mention ESCOs with a background in engineering and design, equipment, energy supply, facility management and maintenance, monitoring and financing. The ESCO companies may have financial capabilities to a greater or lesser extent, and also have a variable interest in taking on the financial risks.

Many different types of services and products are offered by ESCOs. Normally, an ESCO contract should include some *fundamental elements*, such as *energy savings* that are *guaranteed*, resulting in more favourable costs than without the EPC project, *financial arrangements* - by the ESCO or mediated - and *securities* of some kind.

The most *frequent services* offered are: Technical consultation and detailed design; Upgrading of some parts in the facilities, such as lighting, control systems, HVAC and installation of new monitoring systems; Management of engineering and construction; and Monitoring during the commissioning and contracted period for operation and maintenance.

Examples of *additional services* offered are: Supply of electricity, heating, and cooling; Refurbishment in general of buildings; Training; Operation and maintenance service; Installation and operation of renewable energy systems; and Outsourcing.

6. EPC Process

The initiative for suggesting or considering an EPC process and contract can be taken by different organisations, such as Government, or local government organisations and public energy agencies, facility owners and ESCOs.

In principle, the process starts in most cases with an introductory study based on the building owner's actual needs, the current energy situation in one or more buildings, and invitation to one or several ESCOs to submit tenders or proposals.

7. Size of ESCO Industry in Different Countries

The number of ESCOs in different countries varies from very few, in a couple of countries, to hundreds, as in the United States. The annual increase in the United States from 1990 to 2000 has been 24 per cent. A cautious estimate would indicate that the market could increase by ten times or more in countries where EPC solutions are just starting (Lambert, 1999; Leutgöb et al, 2000; Country Report Japan; Goldman et al, 2002).

8. Contract Arrangements

Many agreements are strongly tailored to the needs and expectations of the single client, and many of them are confidential. The Federal Energy Management Program, FEMP, in the USA has developed a full set of guidelines and model contracts.

There are two different important aspects about the process, which influence the structure of the process and the contract arrangements – whether a *competition* is arranged at the beginning (a legal

requirement for public organisations), and the *distribution of different risks* between the parties. The main types are *Shared savings*, where the ESCO offers the financing and takes both the performance and the credit risk, and *Guaranteed savings*, where the ESCO takes the performance risk and the customer is responsible for the financing.

The guarantee of results is the most original feature of EPC and TPF arrangements in the sense that investments in buildings are only paid back in proportion to the savings obtained. Whatever the performance of facilities and equipment installed, the guarantee of results ensures a net decrease of running costs for the customer.

There are also differences in respect of contracts with public entities and contracts with industry.

9. Barriers

The introduction of EPC solutions is progressing very slowly on the new markets. Those contractors that have started to work find that it is a very long process to reach a final contract. The participating countries have identified some *important barriers* in their reports, such as lack of general credibility for EPC, lack of knowledge and standardised contract procedures (NAESCO, 2002; Westling, 2003).

It is very important to increase the involvement of public entities, which represent an important part of possible projects and which also by leading the way can, as in the United States, contribute to raising the credibility for the EPC mechanism (Graz, 2002).

10. Procurement Process

A special legal study performed for the benefit of Task X (Westring, 2002) concludes that EPC certainly is a process where public entities need to open up competition among potential suppliers, first of all in their own economic interest, and, secondly, due to national procurement legislation. For the majority of industrialised countries, such national rules reflect undertakings of the country concerned in the context of a regional integration scheme, such as the European Union, coupled with other international obligations, stemming, for instance, from adherence to the WTO Government Procurement Agreement. This explains why EPC in the public sector, as distinct from procurement by private owners, will need to be carried out in a climate of transparency and fair competition among all eligible suppliers.

The study points, in the first place, to a need for public sector owners to avoid conflict-of-interest situations. In the case consultants have been involved in project identification and preliminary studies, the public building owner and the consultants should consider if a situation of conflict of interests exists.

Another observation made in the study is that, in the case of complex projects, the process of public procurement would need to go forward in stages, once the preliminary studies have indicated the potential for energy savings. First, interested firms should go through a pre-qualification exercise, aimed at restricting competition for the main contract to a limited number of qualified bidders. Such a restriction is desirable in order to encourage the selected bidders to take on the cost and effort of following through in preparing a full-scale tender. Then, a two-stage tendering procedure would follow, in which the selected bidders would submit, in the first stage, unpriced technical tenders, involving an outline proposal to meet the energy savings target. Then, after review by the owner and any amendments to the technical specifications, priced bids for the main contract would be requested and submitted. The contract would then be awarded to the bidder making the best proposal based on a combination of price and performance criteria.

The list of steps included in the suggested procurement process is contained in [Figure 2](#).

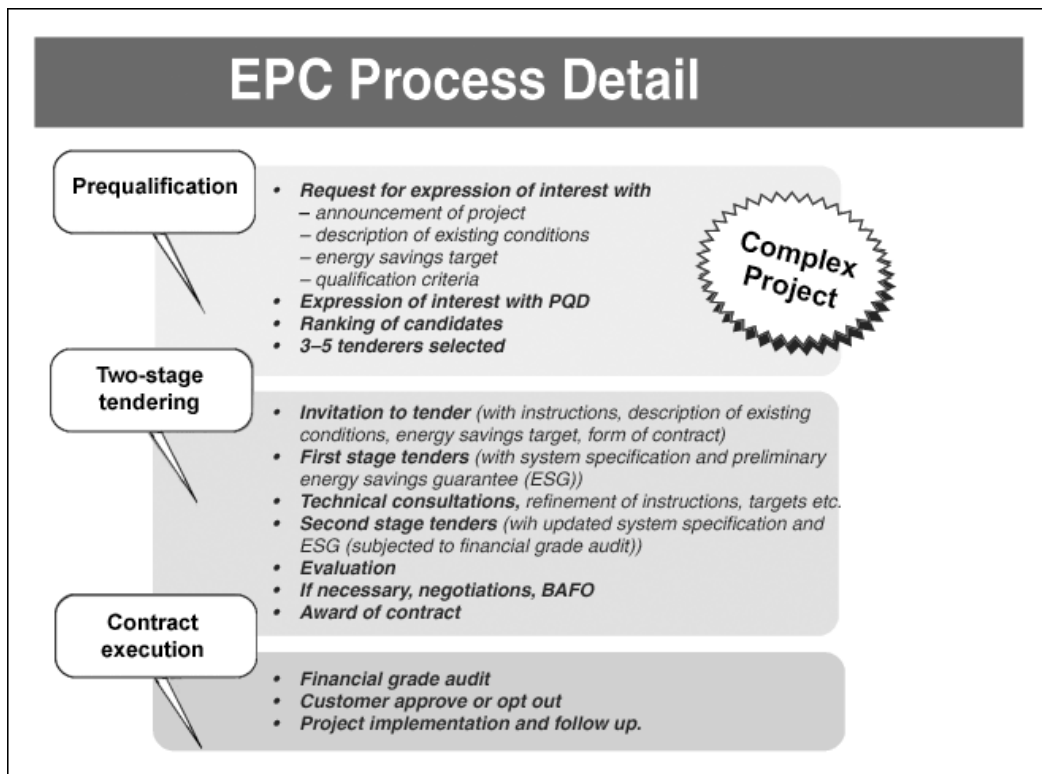


Figure 2: Suggested Procurement Process (Westling, 2003)

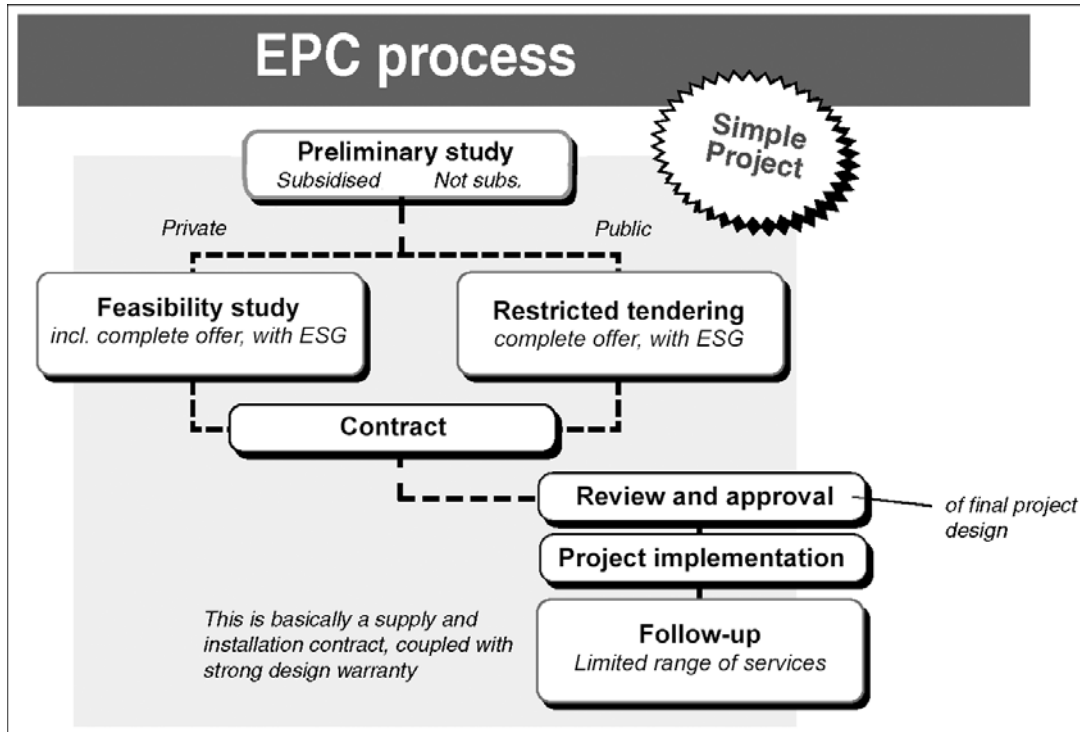


Figure 3: Suggested EPC process – Simple project (Westling, 2003)

A simplified procurement procedure, [Figure 3](#), could be applied in less complex projects where the preliminary study identifies, with some degree of precision, the potential for energy savings and

the investment in goods and services required. In such cases, the process can be concentrated so as to conform to a regular restricted tendering procedure, still coupled with an energy savings guarantee in the contract with the winning ESCO. Bundling of several small projects in one contract is a practical solution.

11. Case Studies

The countries participating in the international project have collected experiences from real projects. 25 different cases have been analysed and they show very promising results with energy savings of 20 – 40 per cent. A very large database in the United States (comprising some 1,500 projects) reports energy savings with a mean value of 23 per cent.

12. Conclusions

The Energy Performance Contracting (EPC) mechanism has already resulted in substantial energy and cost savings – 20 per cent or more – also for building owners with limited investment capital. EPC will contribute to important reductions of polluting emissions and can also play an important role in the programs for reducing the risks for a climate change.

Within a decided continuation of Task X “Performance Contracting”, some areas will be further studied in depth. As the energy market will be more international, it is important that similar actions take place in many countries. Further collaboration between countries will contribute to lower the transaction costs and facilitate increased use of EPC.

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