

EPC IN PRACTICE – GUIDE FOR CUSTOMERS



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EPC in Practice - Guide

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AUTHORS

Jose Daniel Fasolino, Creara

Rodrigo Morell, Creara

Alberto Burgui, Creara

EDITORS

Paolo Michele Sonvilla, Creara

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EPC IN PRACTICE – GUIDE FOR CUSTOMERS

What is Energy Performance Contracting?

An **Energy Performance Contract¹** (EPC) is a contractual arrangement between the beneficiary (or customer) and the provider of energy efficiency measures, where investments (equipment, installation works and operation services) are paid for in relation to a contractually agreed level of energy efficiency improvements and other energy efficiency criteria, such as financial savings.

The **key principle** of Energy Performance Contracting is that **it allows funding energy efficiency measures with predicted cost reductions**, avoiding capital requirements on the beneficiary’s side.

An EPC is a **way to deliver infrastructure improvements** to organisations that lack knowledge of energy equipment performance, energy management skills, and capital funding. Cash-poor, but nonetheless creditworthy organisations are therefore good potential customers for Energy Performance Contracts.

Those organizations wishing to improve their energy efficiency and to reduce energy related costs might engage **consultants, equipment suppliers** or **energy service providers** to assist in this goal. Both sides have common interests and expectations, as they both benefit from achieved savings.

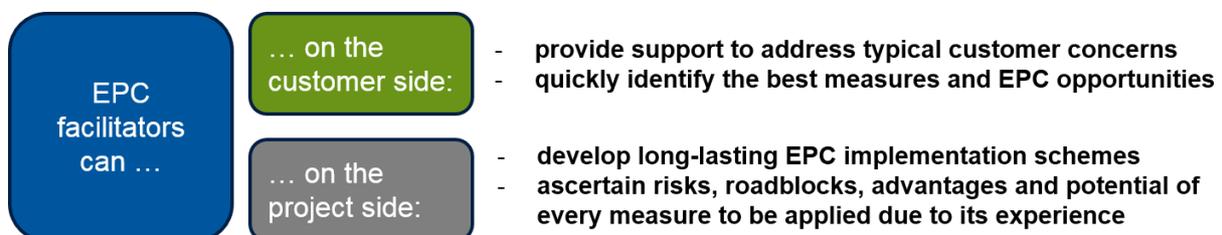
For the customer, the key advantages of EPC are:

- It allows to refurbish and modernise buildings and facilities;
- It provides long-term, guaranteed cost savings with zero or minimal investment;
- It consistently reduces an organisation’s environmental impact;
- It allows outsourcing energy saving tasks to external service providers which are remunerated based upon their performance.

EPC facilitators

Traditionally, organizations start by engaging an energy consultant (EPC facilitator) to identify opportunities for energy savings, ranging from operating practices, to maintenance, controls and equipment investments.

Figure 1: How EPC facilitators build trust in the EPC market



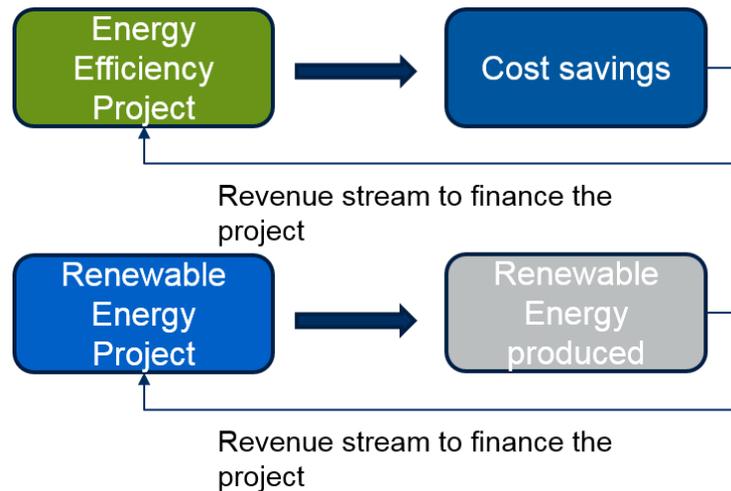
¹ Joint Research Centre – Institute for Energy and Transport

The technical support and experience in energy efficiency provided from EPC facilitators can help to improve the customers' confidence and, therefore, create the conditions for a successful EPC project.

EPC providers

An EPC provider is an energy service provider who delivers energy services in the form of an EPC, assuming the responsibility of its performance.

Figure 2: EPC Arrangements



An Energy Performance Contract merges three types of contract into one: a contract for the refurbishments work, a credit contract and a service contract. Its approach is based on the transfer of economical and or technical risks from the client to the EPC provider, based on performance guarantees given by the EPC provider.

The EPC provider's remuneration is therefore based on demonstrated performance: the main measure of this performance is the level of energy savings.

EPC Models

There are several EPC models; hereby we explain the three most common ones.

Guaranteed savings

The EPC provider designs and implements the project and guarantees the energy savings. If the savings are less than expected, the EPC provider covers the shortfall. Usually a third party provides the financing directly to the customer; the EPC provider may facilitate the financing arrangements.

In a typical guaranteed savings contract the customer takes out a loan from a financier to finance the investments in energy savings. The customer contracts with the EPC provider to implement the energy savings works. The provider assumes performance risk by guaranteeing energy savings. The customer pays the provider on acceptance of the installation, possibly withholding a portion until savings have been verified.

The customer may also pay the provider an ongoing fee to verify savings annually or maintain the equipment. If savings are insufficient, the EPC provider pays the difference between what was achieved

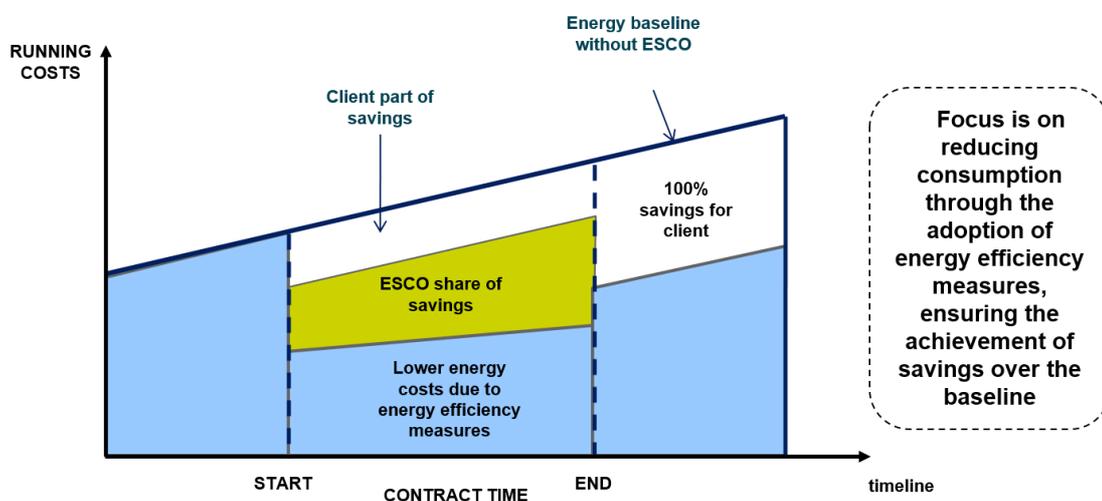
and what was guaranteed. The savings are valued based on a fixed energy price agreed at the outset. Here the provider takes the performance risk, the customer takes the energy price risk and the financier takes the credit risk.

Shared savings

The EPC provider designs, finances and implements the project, verifies energy savings and shares an agreed share of the actual energy savings over a fixed period with the customer. The EPC provider may receive financing directly from a third party.

In a typical shared savings contract the EPC provider offers the capital (perhaps out of its own funds or out of a loan from a third party financier to cover the cost of the investments in energy savings).

Figure 3: Shared savings model



Typically, the term of the contract and the loan will match, and the provider share of the savings will exceed the loan repayment costs. Importantly, the financier is taking the risk that the provider may be unable to repay the loan; if the provider is a small or medium enterprise, the cost of credit may be quite high. In some cases, the energy savings may be valued based on prevailing energy prices, which means the provider also takes the energy price risk. These considerations generally mean the provider is a large enterprise with strong balance sheet and access to capital markets.

Although this contract arrangement can specify that the EPC provider will guarantee, rather than share, the savings, the provider is likely to prefer to share. Sharing savings incentivizes the customer to minimize energy use and reduces the energy performance risk.

Variable contract terms

The EPC provider designs and implements the project and verifies the energy savings. If the savings are less than expected, the contract term can be extended to allow the provider recover its full payment. A variable contract term arrangement is similar to a shared savings, except that it reduces the risk for the provider if the quantity or value of savings is less than expected.

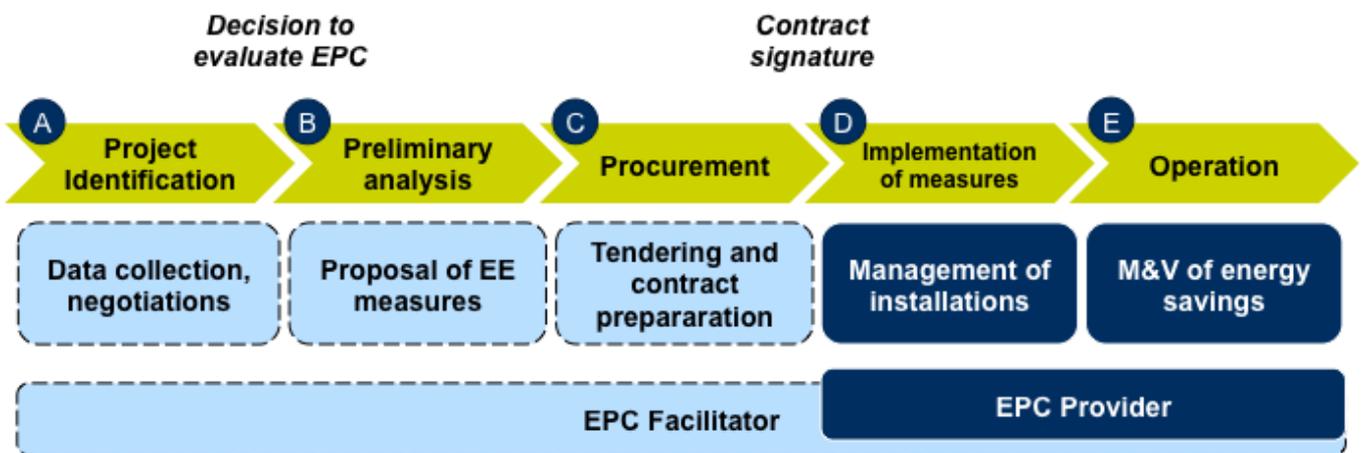
A variation of this arrangement is called 'first out', in which case the EPC provider receives 100% of the verified energy savings each year until it has received its original capital plus an agreed profit. At that

point, the contract ends and the owner starts receiving all the savings. The advantage of this arrangement is that it reduces the amount of time the customer and EPC provider are bound together.

The EPC Process

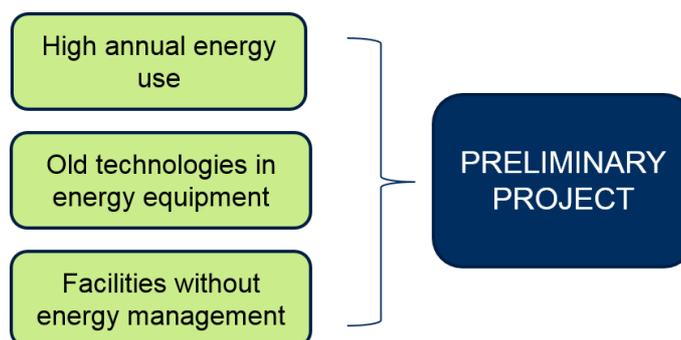
The five basic steps necessary to initiate and complete the process of awarding an energy performance contract are summarized in *Figure 4*. As shown, the process begins with the identification of a potential energy efficiency project and concludes with the successful obtainment of savings through installed equipment.

Figure 4: EPC process summary



A - Project Identification

Figure 5: Project identification key points



This initial step can be supported by an EPC facilitator, or by the end user if it has a good degree of energy efficiency knowledge. It usually involves the collection and analysis of data related to energy uses, the benchmarking of all major consumptions in the evaluated facility, and the development of a

simple energy audit analysing equipment, estimating consumption factors based on the energy bills of the previous years.

Often, it makes economic sense to combine several facilities into a single project. Multiple building projects with excessive energy costs are usually very attractive and allow the agency to finance and obtain a greater number of energy improvements through a single procurement process.

B - Preliminary analysis

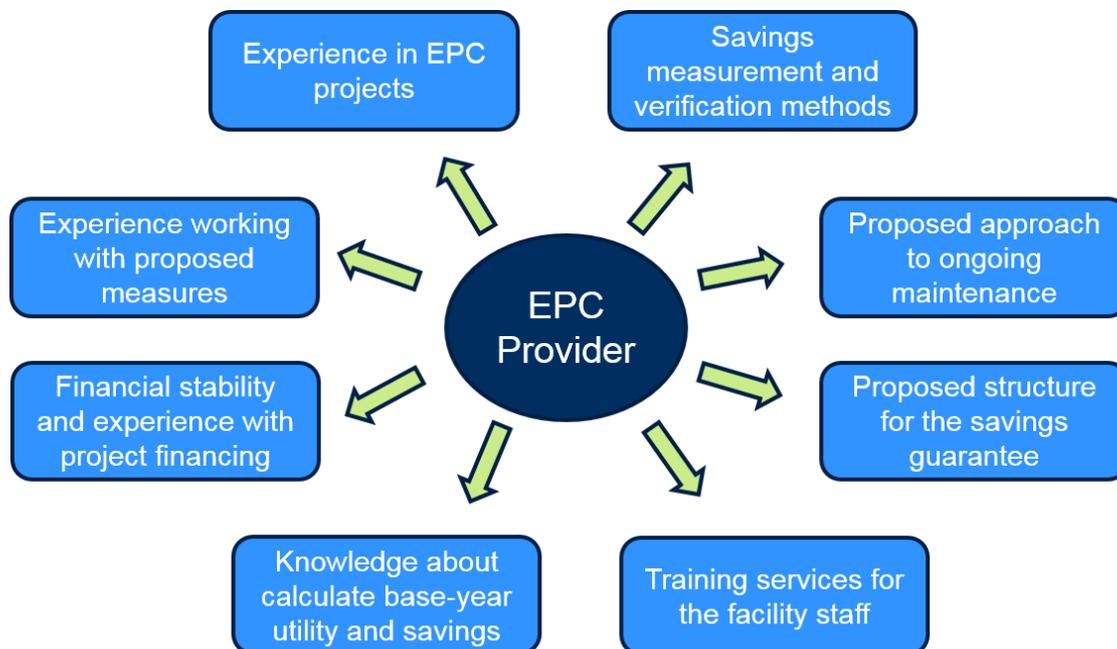
Rather than pre-determining a detailed scope of work specifying which energy efficiency measures the beneficiary should undertake, the EPC model uses the technical expertise of the EPC facilitator or provider to help identify and assess the most cost-effective energy savings opportunities.

This analysis involves a general technical overview of the selected project site. The EPC facilitator or provider will need enough technical details to adequately assess the opportunities to develop and implement a successful project. Generally, such information includes the facility's size, its energy uses, equipment, hours of operation, occupancy level, maintenance problems and it takes into account any planned equipment replacement or building renovation works.

C- Procurement procedure

The final customer, when looking to appoint the appropriate EPC provider, should look out for the key factors illustrated in *Figure 6*.

Figure 6: Skills of an EPC provider



It is recommended to have preliminary meetings and site visits scheduled with all candidate EPC providers with the purpose of answering any questions related to the facilities and clarify technical matters. An EPC facilitator can very well support this process. A preliminary cash flow analysis should be offered by the candidate EPC provider to illustrate how the project will perform, financially, over the term of the contract.

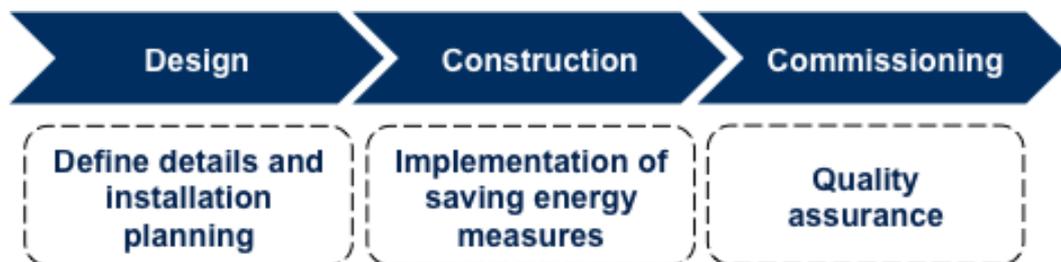
D – Signature of contract and implementation of measures

The final Energy Performance Contract serves as the blueprint for how the project will operate over the contract term. The EPC should specify each party's role and responsibilities and should explicitly state how the project is expected and guaranteed to perform. Due to the long-term nature of this relationship, the contract should be specific yet flexible enough to accommodate both current and future facility needs.

The main body of the contract frames the basic legal provisions and allocates specific responsibilities to each party. It specifies governing laws, conditions of default and remedies, regulatory requirements (e.g., insurance, labour and wage rates, code compliance, etc.), and indemnification provisions. The contract can be customized to accommodate additional terms and conditions as necessary

Since individual projects and circumstances vary, companies should seek appropriate legal advice about individual EPC projects and work closely with them to incorporate any special contract terms and conditions into the final contract.

Figure 7: Project implementation phases



Before the start of the actual realization of the energy saving measures, it is necessary to properly plan for its different steps:

- The **design** phase, which consists of the final design details and installation planning for the agreed-upon energy efficiency measures;
- The **construction** phase, which consists in the completion of the installed energy saving measures, focusing on the review and approval process and regular monitoring of the construction process for quality assurance;
- The **commissioning** phase, to assure that the installed energy saving measures are operating as designed.

E – Operation

The foundation of an Energy Performance Contract is the assumption that the installed energy efficiency measures will result in reduced energy use, allowing the corresponding cost savings to be used to repay the investments over the foreseen duration of the contract.

The final step of the EPC project process therefore consist in the operation of the energy efficiency measures, including monitoring of their performance, monitoring of achieved savings, executing necessary maintenance activities, and ensuring standards of service and comfort over the lifetime of the EPC contract.

Measurement & Verification (M&V) is the formal process of determining and documenting that the installed energy efficiency measures are producing the guaranteed savings. The International

Performance Measurement & Verification Protocol (IPMVP) is the most commonly used and recognised market standard for EPC projects. When properly applied, it can accurately estimate energy savings of a project, estimate emissions reductions from energy savings and quantify improvements in indoor environmental quality.

Supervision of the M&V process, continuous commissioning, and effective maintenance are all essential tasks to maximise an EPC project performance. Annual review meetings with the EPC provider are recommended in order to supplement the regular tracking of maintenance activities or standards of service and comfort; they also serve as an annual opportunity for facility staff and the EPC provider to discuss strategies for optimizing project results.

PROJECT COORDINATOR
Creara



CROATIA
Energetski institut Hrvoje Požar



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ENERGIES 2050



Green Rating Alliance



GREECE
Technical University of Crete



TECHNICAL UNIVERSITY OF CRETE (TUC)
SCHOOL OF ENVIRONMENTAL ENGINEERING
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Paolo Michele Sonvilla
Project Coordinator
mobile +34 672132194 - pms@creara.es
info@trustepc.eu - www.trustepc.eu