

IEA DSM TASK XVI

**“Competitive Energy Services
(Energy Contracting, ESCo Services)”**

in cooperation with:
European Energy Service Initiative (EESI)

What is Energy Contracting (ESCo services)? Concept, Definition, Two Basic Business Models

- Discussion Paper -



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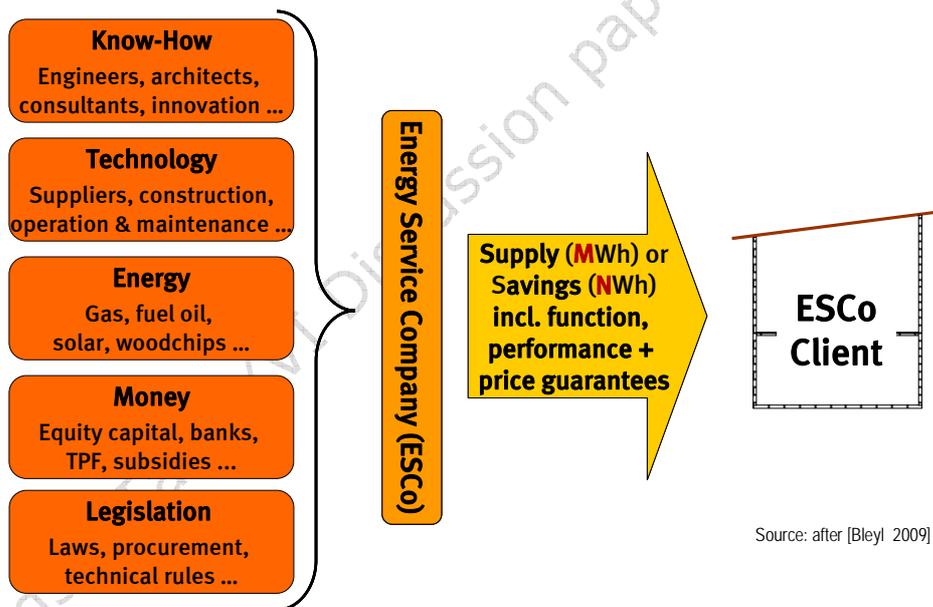
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Source: after [Bleyl 2009]

Figure 1: What is Energy Contracting? An integrated energy service with outsourcing of risk, interfaces and guarantees to an ESCo

1 Motivation

"We will leave a steam engine free of charge to you. We will install these and will take over for five years the customer service. We guarantee you that the coal for the machine costs less, than you must spend at present at fodder (energy) on the horses, which do the same work. And everything that we require of you, is that you give us a third of the money, which you save." [James Watt, 1736-1819]

The concept of Energy Performance Contracting was born early in the industrial revolution. While motivation may have changed over time – the search for suitable business models for the implementation of innovative technologies is ongoing.

One of the most important and at the same time most difficult energy policy and energy economics tasks continues to be the search for suitable implementation instruments for energy saving potentials. The level of success is far from satisfactory as the continuous increase in final energy consumption reveals. Since the mid of this decade, Energy Services (ES) have climbed high on political agendas and have even reached the headline of energy efficiency legislation [2006/32/EC].

Energy Contracting (EC) is cited many times as a smart multi-purpose-instrument, which will help to overcome market barriers for Energy Efficiency (EE). While a number of obstacles can be overcome with the EC concept, the pros and cons, the realistic potentials, the limits and added values of ESCo products in comparison to in-house implementation need further clarification.

Most existing EC definitions¹ fall short with regard to important properties of "real" EC projects such as outsourcing of risks to the ESCo, guarantees for "all inclusive" cost and results of the measures implemented, modularity of the service package or optimization according to project cycle cost. These constitute important quality features of "real" ESCo products as opposed to simple energy services. And they constitute an added value compared to in-house implementation models.

Also the two basic business models – either delivery of useful energy (Energy Supply Contracting - ESC) or energy savings (Energy Performance Contracting - EPC) and their implications are not distinguished well enough.

The goal of this discussion paper is to

- ✓ develop a common understanding of the key features of „real“ Energy Contracting projects
- ✓ support European and other standardization and definition efforts such as [CEN/CLC/TF 189]
- ✓ increase understanding of Energy Contracting as a tool for implementation of energy efficiency: Pros and cons, potentials, limits and added values of ESCo products in comparison to in-house implementation

¹ cf. [2006/32/EC], [Bertholdi et.al. 2007], [CEN/CLC/TF 189], [DIN 8930-5], [GEFMA 540], [UZ 50], [VDMA 24198] this list is not exhaustive

Given the complexity of the EC concept this has to be considered as “work in progress”. Feed back, questions and further cooperation are highly welcome. Please contact the authors attention to Jan W. Bleyl or Reinhard Ungerböck (contact details on page 2).

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2 Energy Contracting (ESCO Services)

2.1 Definition and Concept

„Energy Contracting - also labeled as ESCo or Energy Service - is a comprehensive energy service concept to execute energy efficiency projects in buildings or production facilities according to minimized project cycle cost.

An Energy Service Company (ESCO) implements a customized energy service package (consisting of planning, building, operation&maintenance, optimization, fuel purchase, (co-)financing, user behavior ...). The ESCo provides guarantees for all inclusive cost and results and takes over commercial and technical implementation and operation risks over the whole project term of typically 10 to 15 years (after [Bleyl+Schinnerl 2008])

The Energy-Contracting concept shifts the focus away from selling units of final energy (like fuel oil, gas or electricity) towards the desired benefits and services derived from the use of the energy, e.g. the lowest cost of keeping a room warm, air-conditioned or lit.

Energy Contracting (EC) is not about any particular technology or energy carrier. Instead EC is a flexible and modular “efficiency tool” to execute energy efficiency projects, according to the goals of the facility owner. It is an instrument to minimize life- or project cycle cost², including the operation phase of the building. The ESCo acts as coordinator and manager of interfaces towards the customer and has to deliver the commissioned energy service to the customer at “all inclusive” prices as displayed in Figure 1:

Figure 2: illustrates and energy added value chain from primary to useful energy and energy saving services.

² Here the sum of investment, operation and maintenance cost over the project term, also labeled as total or life cycle cost. E.g. capital-, consumption- and operation cost according to [VDI 2067] or [ÖNORM M 7140]

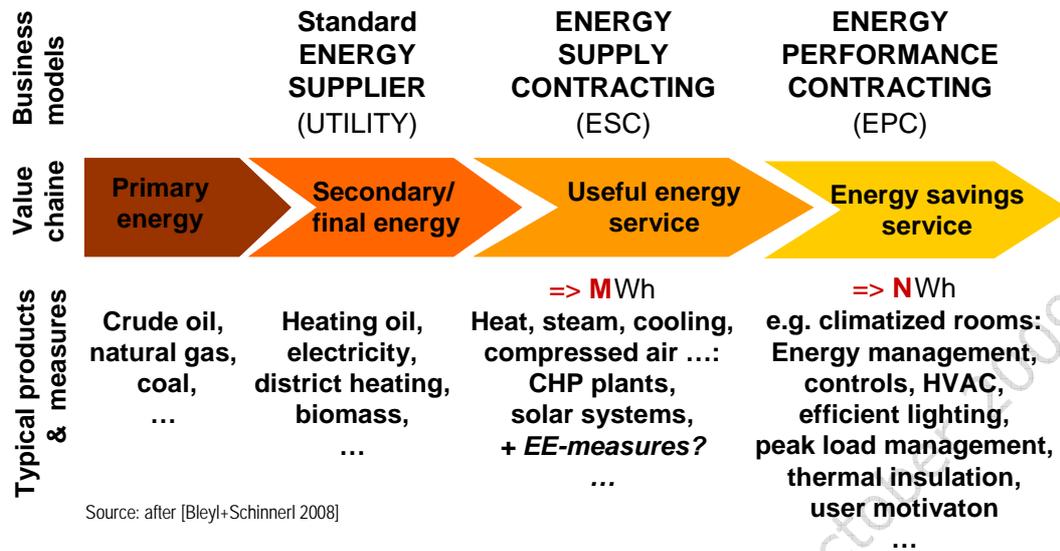


Figure 2: Energy service value chain, business models, typical products and measures

ESCo products provide either useful energy (Energy Supply Contracting - ESC) or energy savings (Energy Performance Contracting - EPC) to the end user. And they achieve environmental benefits due to the associated energy and emission savings as well as non-energetic benefits such as increase in comfort or image gains.

The two business models are described in the next chapter.

2.2 Two Basic Business Models

Two basic business models can be distinguished, cf. Figure 3:

1. At **Energy Supply Contracting (ESC)** efficient supply of useful energy such as heat, steam or compressed air is contracted and measured in Megawatt hours (MWh) delivered. The business model usually includes purchasing of fuels and is comparable to district heating or cogeneration supply contracts. The scope of energy end-use efficiency measures is usually limited to the energy supply side of the building or enterprise, e.g. the boiler room. It can also be applied to energy supply from renewable sources, e.g. solar ESC.
2. As for **Energy Performance Contracting (EPC)**, the focus is on reducing final energy consumption through demand side energy efficiency measures. The scope is extended to the entire building or enterprise including measures such as technical building equipment, user behavior or the building envelope insulation as indicated in Figure 3: . The business model is based on delivering savings compared to a predefined baseline, also labeled as Negawatt hours (NWh).

Figure 3: illustrates the typical scope of services of the above mentioned Energy-Contracting models.

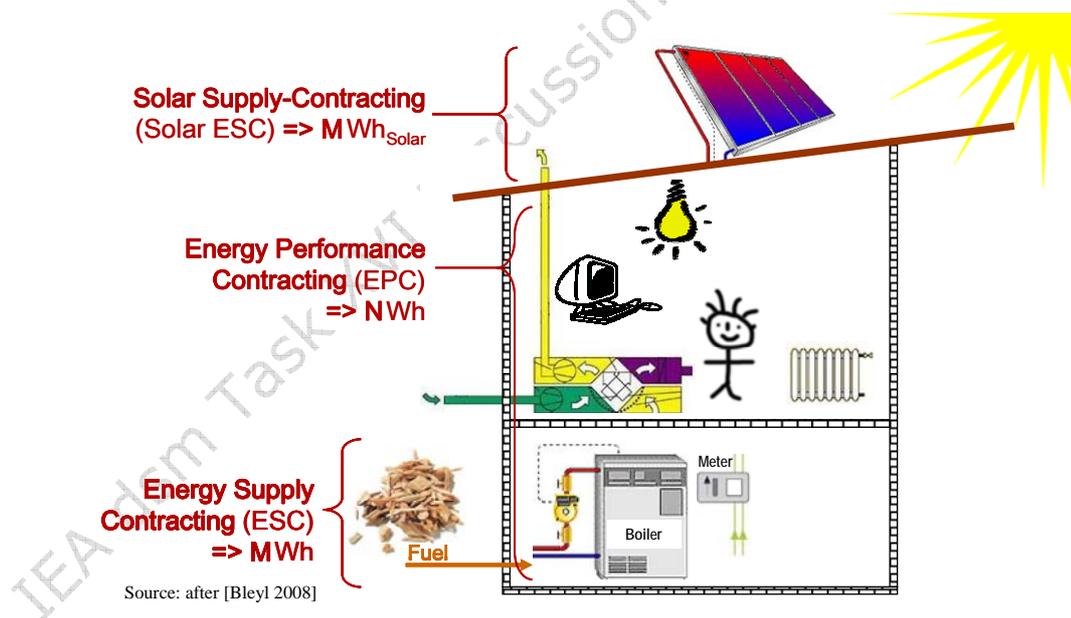


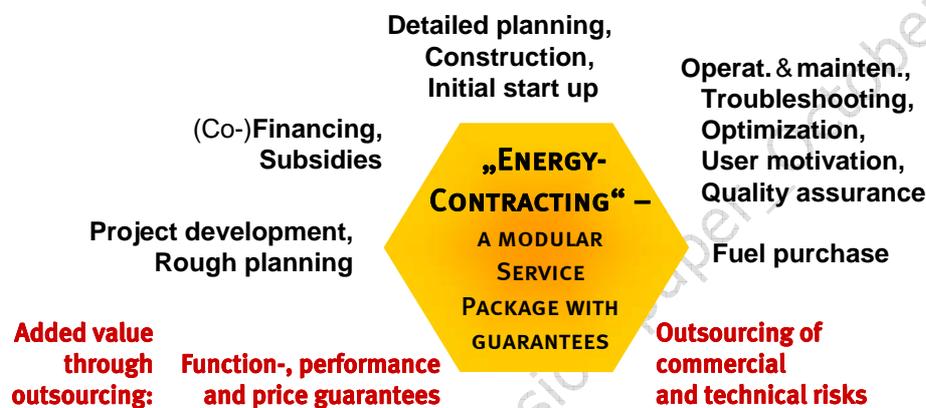
Figure 3: Scope of services of two basic ESCO models

Most ESCO products are based on either one of the above business models.

2.3 Modular Scope of Services

Most energy efficiency projects differ in their contents and general conditions. Therefore, it has proved to be necessary and sensible to adapt the scope of services specifically to the individual project. This also means the building owner can – depending on his own resources – define what components of the energy service will be outsourced and which components he or she carries out in-house (e.g. financing³ or ongoing on-site maintenance provided by a caretaker).

The necessary components for implementing energy (efficiency) projects are summarized in an energy service package with result guarantees given to the client as displayed in Figure 4:



Source: after [Bleyl+Schinnerl 2008]

Figure 4: Energy Contracting: A modular energy service package with guaranteed results for the client

All the tasks shown in the figure, such as planning, construction and financing, as well as all the ongoing components of the service, such as operation and maintenance, optimization, purchasing of fuel and quality assurance, have to be covered by the building owner or the ESCo throughout the contractual period.

In the ESCo's prices, all the expenditure items for the defined scope of services throughout the contractual period must be included ("all inclusive prices"). Correspondingly, project or life cycle costs (LCC) are calculated at the Energy Contracting model.

The functional, performance and price guarantees provided by the ESCo and the outsourcing of technical and economic risks to the ESCo constitute an added value for the client, which should be considered at the comparison with an in-house implementation.

³ In contrast to widespread opinions, the ESCo service package does not automatically need to include financing. Financing can be provided by the building owner, the ESCo or a third financing partner, depending on who can offer the better conditions. In any case, the ESCo can be used as a vehicle and facilitator for financing. This topic has been elaborated in more detail in [Bleyl+Suer 2006] or [Bleyl+Schinnerl 2008a].

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