CONCERTED ACTION
ENERGY SERVICES
DIRECTIVE

Energy companies and energy services

Core Theme Series Report CAESDII/CTSR/4.1

Daniele Forni, ENEA/FIRE, Italy

Date: June 2012

Introduction and context

This report summarises the work carried out during the first year of the second Concerted Action for the Energy Services Directive (CA ESD) on the topic of energy companies and energy services. The objective of the work was to investigate business models, supporting frameworks and policies to develop and foster the energy services market, collecting, presenting and discussing interesting examples and good practice.

Energy services give the Energy Services Directive (Directive on energy end-use efficiency and energy services) its name and are thought to be among the most cost-effective means to improving energy end-use efficiency. One of the purposes of the Directive is "creating the conditions for the development and promotion of a market for energy services and for the delivery of other energy efficiency improvement measures to final consumers".

The focus of this work was on two areas: a) energy services for large buildings and industries, with particular attention on business models and b) small clients – households and small and medium enterprises and related policies. Information was collected from Member States as well as from Norway and Croatia via questionnaires on the situation in their countries, including examples and good practices.

New and existing business models for energy service in industries and large buildings

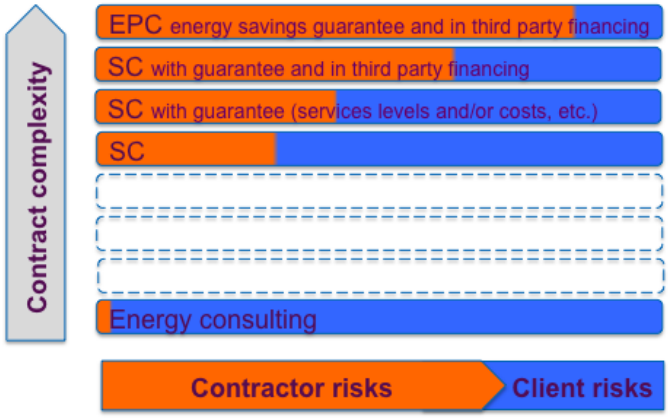
The aim of this topic is to present business models for energy services and the support measures implemented by Member States at different stages of the energy services market.

Energy services as defined in the Energy Services Directive are a combination of energy with energy efficient technologies and/or with action, which in normal conditions lead to an increase of the energy efficiency[1].

There are some variations in the energy services offered to industry and large buildings, with a general tendency towards energy performance contracting (EPC) and supply contracting. Some of these business models can be considered as variations of EPC and supply contracting.

A fundamental difference between the major business models for energy services is that in an EPC[2] model, there is an energy saving guarantee, while in supply contracting the guarantees are limited to specific aspects of the service (level of service, quality, costs, etc.). As underlined by participants, a focal point of energy services is risk allocation. The risk allocation should be clearly stated in the clauses of the contract and is strictly related to the guarantees given by the contractor. As shown in Figure 1, the risk is transferred from the client to the contractor, with higher outsourcing of energy services. Higher outsourcing and risk increase the contract complexity, from consultancy to EPC.

Figure 1 - Energy services outsourcing, risk sharing and contract complexity



[1] Directive 2006/32/EC article. 3.e '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.

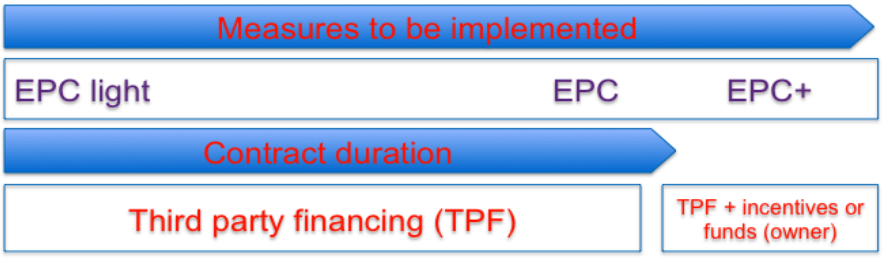
[2] Directive 2006/32/EC article. 3.j 'energy performance contracting': a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement.

The work focussed on the following energy performance contract business models: EPC+, 'EPC light', green EPC, and EPC with stepping contract[3].

Business models for supply contracting were also looked at and, included: Contract Energy Management[4], Business Improvement Service[5], and Integrated Energy Contracting[6]. The latter is the most interesting variation, being a supply contract with quality assurance measures but without the guarantee of results and thus without the cost and complexity of energy performance contracting. Integrated energy contracting seems to show very promising results in its first applications. At present, however, there are only a few examples, so its ability to be replicated is still to be proved.

'EPC light' is oriented to facilities where only minor measures are to be implemented and where savings can be obtained by optimising management, operation and maintenance. It is similar to the North American Recommissioning[7] service. Conversely, EPC+ is applied when deeper renovations are needed and the payback time is longer than the duration of the contract. Measures with longer payback periods are co-financed by the owner, public funds or incentives, meaning that all the measures can be implemented, producing higher savings from the outset (Figure 2).

Figure 2 - EPC light, EPC and EPC+



Green EPC is oriented to renewable energies and contains specific green parameters/objectives. In an EPC with a stepping contract the ESCO starts by implementing some measures for a client. After this first step, the ESCO has a deeper knowledge of the client and his problems and can identify a set of new measures. Those new measures can be agreed and implemented in a second step either within the same contract or within a new contract.

The examples of energy performance contracting and supply contracting cover a wide range of needs, from situations where measures are more oriented to good management and less to investments in efficiency (EPC light or for supply contracting the Contract Energy Management[8]) to the opposite case where a deeper renovation is needed with a payback period longer than the duration of the contract (EPC+).

In the past, energy services with third party financing were defined as "a form of 'creative financing'"[9] whereas now the Business Improvement Service is presented as a way to better use part of a current budget to obtain budget savings in the future.

Energy performance contracting appears to be very flexible but it is still not widely used across Europe. There are still some problems in many Member States around public tendering for energy performance contracting, mainly due to its complexity and to various problems related to the legislative frameworks. There are some experiences of energy performance contracting in public private partnerships and some Member States representatives consider this an interesting way to implement energy performance contracting.

Some Member States representatives highlighted their support for the diffusion of energy performance contracting through legislative acts, model contracts and guidelines. They also indicated some challenges for fostering the development of energy services related to legislative frameworks for public tendering and taxation, guarantee funds, etc.

[3] More information on advanced EPC and IEC can be found in the presentations of Susanne Berger and Vladimir Sochor on 26-11-2011 (www.esd-ca.eu) or in European Energy Service Initiative (EESI) project website (www.energy-service-initiative.net)
[4] Information from: Energy Service Companies Market in Europe - Status Report 2010, JRC, P. Bertoldi et al.
[5] Presentation of D. Malley in CA ESD II meeting 25-11-11 (www.esd-ca.eu)
[6] Integrated Energy Contracting is discussed by IEA DSM Task XVI and applied by Grazer EnergieAgentur. See also footnote 3
[7] www.energystar.gov/ia/business/EPA_BUM_CH5_RetroComm.pdf
[8] There is no unique definition of Contract Energy Management. It is a supply contract, but in some cases (as it is intended here) is an outsourcing of the (energy) management, maintenance, etc. but without implementation of (important) hardware measures, while in other cases it implies the implementation of energy efficiency measures in third party financing.
[9] Definition of EPC in Energy Service Companies in Europe, status report 2005, P. Bertoldi and S. Rezessy

It was highlighted that different measures have to be considered for different stages of the energy services market. In an under-developed market, a systematic approach is needed, through simpler projects with concrete and visible results in the short term or through a global approach to contracts, risk assessment and guarantees. In more developed markets there is less need for new demonstration activities; it is more important to identify the gaps and barriers, such as legal, budget/accounting or economic/financing issues.

Combining the different experiences from Member States, it is possible to draw the main steps of an ideal approach to foster Energy Services:

- An independent study, involving stakeholders, on barriers and proposals;
- Modification of legislation and rules on public tendering and accounting;
- Demonstration activities with successful pilot projects
- Informative campaigns for clients and training for clients and service providers;
- Guides and models for contracting;
- Market facilitators (e.g. public energy agency) to support tendering of complex public projects;
- Subsidies to start and develop the market;
- Guarantee/revolving funds to start and sustain the third party financing;
- Third party (e.g. public energy agency) involved in energy audit and business plans;
- Instruments to increase the quality of the offer and trust on the market (e.g. official public website containing updated list of ESCOs and their references, ESCOs certification, etc.).

In order to support the Energy Services, it is necessary to have a mix of measures suited to the stage of development of the market and the national legislative framework. Moreover, some of the examples provided by Member States show interesting applications of Energy Services in low performing economies and period of economic cuts in both private and public sectors. For example, supporting programmes to reduce the energy expenditure of public buildings via energy performance contracting in third party financing or taking advantage of a low activity period of building sector to re-train workers on the integration and installation of energy efficient technologies.

Good practice examples

Finland: “Information dissemination about ESCO services for clients in Finland”
The funding comes from the Ministry of Employment and the Economy, with the aim of disseminating information about the ESCO service to all energy users in industry and service sectors, who are the target groups/clients, especially people in the municipal sector who work on energy efficiency and procurement. The financing for the project has been approximately 12-15 man days per year over ten years.
The service offers: ESCO seminars for ESCOs and potential clients, ESCO project register, ESCO marketing material e.g. guidelines, brochures and articles about ESCO services, information dissemination and contacts to separate studies about ESCO services**.**

Spain: “Supporting measures for Energy Services in public buildings and financing Energy Services in Spain”
The Spanish energy agency (IDAE) or another public body related to the programme provides energy audits of public buildings for energy performance contracting and makes an assessment for financing. There are three programmes: “Energy efficiency plan in the buildings of the state general administration” and “ESCOs Plan 2020”, that aim to stimulate the Energy Services market and reduce the energy consumption in the energy consuming centres of central and local administrations, by subsidising 15% of the eligible investment. The “Sustainable Investment ICO-2011” aims to facilitate ESCOs’ access to financing as the level of guaranties banks usually demand for operations of the kind is lowered. ICO-2011 applies to the building sector, transport sector, high efficiency CHP, etc.

The ESCOs aiming to receive the financing must register on the IDAE online database, submitting a technical report, the budget of the project, the preliminary contract with the customer, etc. IDAE can approve the project, issuing a risk certificate which identifies the ESCO, the project and the maximum amount to be funded. Funding can be requested from any ICO-2011 qualified financial institution.

The cost of the “Energy efficiency plan in the buildings of the state general administration” programme amounts to 42.5 million Euros for 2010-2011, plus 4.2 million Euros to compensate ESCOs for taking part in the competitive dialogue; 80 million Euros for “ESCOs Plan 2020” and 600 million Euros for the Sustainable investment line for “Sustainable Investment ICO-2011”.

More information on this scheme can be found on the CA ESD website: http://www.esd-ca.eu/good-practices/member-state-presentations/energy-services and at http://www.esd-ca.eu/good-practices/good-practice-factsheets/energy-services.

Offer side: energy services for small customers

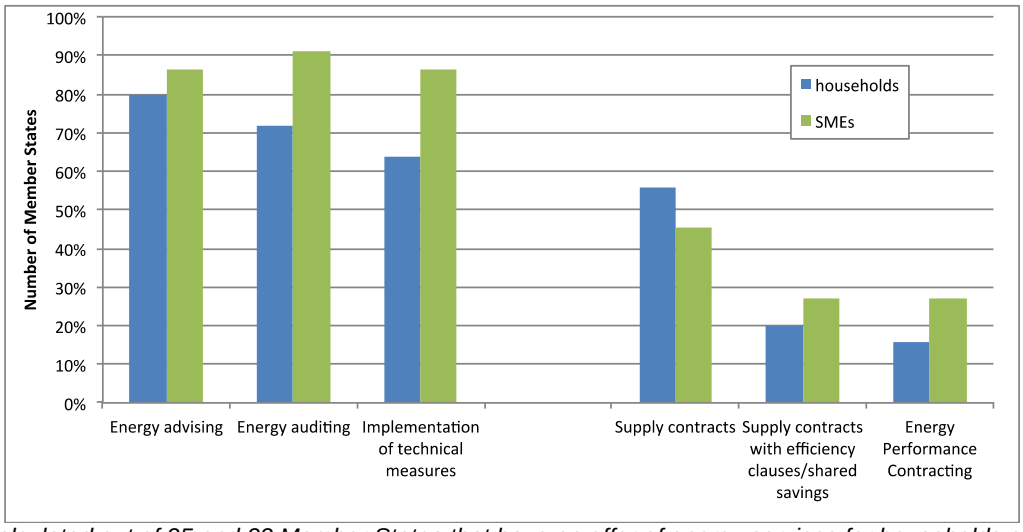
Small customers, such as householders and Small and Medium Enterprises (SMEs), represent a huge potential for energy saving as well as a very dispersed and complex market. Information and awareness are still the main problems, along with cost and the long payback time of efficiency measures with high saving potential. Energy services, with the appropriate support of information, incentives and financing mechanisms, can be the right tool to boost energy efficiency amongst small customers.

Energy services can range from services (e.g. heating service) with demand and/or supply side efficiency measures, third party financing and/or energy performance guarantee, service supply without performance guarantee and/or financing, down to energy audits and energy advice. The latter two aspects can lead to energy efficient behaviour changes and choices, but without other supporting/implementing measures they should not be considered energy services.

Energy services offered

The majority of CA ESD participants reported that services related to energy efficiency are offered under certain circumstances: in 25 Member States for households and 22 Member States for SMEs. Energy services with the implementation of technical measures exist for households in over 60% of Member States and in almost 90% for SMEs. Energy advice and auditing are present in a higher share. Auditing is more common for SMEs and advice for households. Household advice is more frequently web-based whereas advice for SMEs is usually delivered on-site.

Figure 3: Offer of services related to energy efficiency and contract types for energy services in Member States



Percentage is calculated out of 25 and 22 Member States that have an offer of energy services for households and SMEs respectively

The implementation of building envelope measures for households and the introduction of energy management systems in SMEs are reported to be available in over 60% of Member States. Auditing, advice and measures are often supported by incentives. Other activities, such as provision of advice, subsidies and the creation of simplified management systems, are also in place to support the implementation of energy management systems in SMEs.

Looking at the business models, around 20% of Member States have an offer of energy service contracts with energy efficiency clauses, while energy performance contracting is reported by around 15% of Member States for households and by around 30% for SMEs, but does not reach the levels observed for large consumers. In industry and large buildings, energy performance contracting is reported to be spreading in 14 Member States and in another 7 is present in at least one sector. Some of the simplified business models of energy services, such as integrated energy contracting, which at the moment has only a few applications can be of interest to small customers.

Schemes/policies under which energy services are provided

In some cases, obligation schemes or other special purpose programmes are a driver for the provision of energy services to small clients. For households, energy efficiency measures are used in 30% of Member States as a tool to tackle fuel poverty through programmes and/or obligations. In many cases those measures are defined in the National Energy Efficiency Action Plans.

Mandatory energy services such as obligations and voluntary agreements are present in less than 30% of Member States for households and in around 10% of Member States for SMEs (including pilot projects, but not white certificate systems). In Bulgaria[10] energy saving obligations are directly imposed on SMEs that are above a certain threshold of energy consumption.

Monitoring results of energy services for small clients takes place in a limited number of cases and mostly in connection with obligations, incentives or white certificate systems.

New solutions for households

A long term loan attached to the property for diluting the upfront cost of installation, this is the base of "On-bill financing" and Property Assessed Clean Energy (PACE). They represent a solution to financing energy efficiency and renewable energy measures in households and SMEs with lower risk and thus lower interest rates. The loan is repaid through the energy bill, in case of Green Deal, or the property tax, in the case of PACE, so it remains attached to the building or the building energy meter if/when the owner changes. The Green Deal clearly solves the owner-tenant problem, but the application of PACE for rented homes seems problematic as the property tax is usually paid by the owner. Both programmes require a certain commitment to set up the legislative, financial and quality control frameworks and so seem more apt for implementation on the national level, although there are also experiences at the municipal level in the US.

The evaluation of savings is one of the major challenges, as the golden rule of energy services provided through the Green Deal and PACE is that monthly repayments must be lower than achieved savings. Advisors must be independent and capable of evaluating the savings, taking into account all technical and behavioural aspects, including the possible rebound effects (i.e. the change of habits from the sacrifice of comfort, with low or no heating in some rooms of a poorly insulated house, to more comfort-oriented habits, heating all the rooms of a more insulated house).

The Green Deal and PACE were identified as good practice to boost the implementation of energy efficiency measures and renewable energy sources in households. As a consequence, every Member State should evaluate adapting one of them, or at least consider the most important points discussed, when developing future supporting policies:

- Golden rule: savings are higher than the loan repayments
- Address the "owner - tenant problem"
- Loan linked to the property and not to the owner
- Long term loan, possibly with low interest rates
- Strong control of the whole chain from assessors to installers
- Addressing fuel poverty alleviation through energy efficiency measures
- Good communication tools

Policies for SMEs

Both PACE and Green Deal can be applied to small enterprises as well as households, but due to the long term nature of these schemes, are considered to be more appropriate for the small enterprises of the service sector, addressing the efficiency of buildings, than to those in manufacturing sector. Two further approaches to boosting the energy service market for SMEs included the Bulgarian energy saving obligation imposed directly on SMEs consuming more than 3,000 MWh/year and in Ireland the Sustainable Energy Authority Ireland (SEAI) offering advice and mentoring to SMEs and training for introducing energy management systems.

Energy efficiency measures in SMEs are less standardised and the support should be more tailored to the type and size of the organisation. There is no unique supporting mechanism to start or boost the energy service market, but a framework of measures (e.g. information and mentoring, incentives for energy audits, simplified energy management systems, sector networks for benchmarking and exchanging of good practice etc.) to be considered and adapted to the specific needs and with consideration of the development stage of the market.

[10] For more information please see the CA ESD website: http://www.esd-ca.eu/good-practices/member-state-presentations/energy-services

Good practice examples

USA: “PACE”

The Property Assessed Clean Energy (PACE) policy focuses on the upfront cost in energy improvements. It is structured to enable local governments to raise money through the issuance of bonds to fund clean energy projects, allowing residential property owners to install energy efficiency measures, solar thermal, and solar PV, while paying for the cost over a 20 year period through a special tax which is collected as a line item on the property tax bill.

In case the property is sold before the end of the repayment period, the new owner takes over the remaining special tax payments as part of the property’s annual tax bill. PACE addresses the problem of high initial costs and the concern of some property owners that they will not get the full benefit of their investment if they sell the property.

The planning should integrate the government’s greenhouse gas reduction targets or economic development. The ability to fund these types of districts is perhaps the biggest hurdle for many policy makers. Governments with large reserves may benefit from the financing as one of their investment portfolio strategies. Funds may come from regional investment portfolio strategies or from financial partner.

This step is likely to require several actions by a Government, Authority or agency. Consequently key people that should be involved are Local Government, banks/financial partners, contractors/installers and advisors.

The target of the policy is low income households (homeowners), and projects are financed by the private sector: banks, financial institute, and insurance companies but use public monies and grants when available.

A sample budget assumes 800 projects financed in a year with an average project cost of $15,000 for a total of $12 million in funding. Estimated administration, finance and other cost are about $560,000.

UK: “The Green Deal”

The Green Deal aims to encourage wide-scale refurbishment of the UK housing stock, reducing carbon emissions, reducing the number of households in fuel poverty and maximising the economic benefit from the retrofit programme.

First, an authorised Green Deal Advisor gives an impartial assessment of a building’s energy efficiency, and how it can be improved. A Green Deal provider can then help turn this into a bespoke ‘Green Deal Plan’, and private companies will make the upfront investments into energy efficiency measures, and recoup payments through electricity bills. Thanks to this mechanism, consumers face no upfront costs.

The "Golden Rule" specifies that any charge should be less than the expected savings from the work done. For particular measures or households where the Golden Rule doesn’t work, the new Energy Company Obligation will provide additional support.

The Energy Company Obligation will replace the current system of insulation and retrofit subsidies mandated from the energy suppliers. The Green Deal Programme could help British households and businesses to save 21TWh of energy by 2020.

The key people involved in the programme are: Green Deal providers (retailer, community group, energy supplier), Green Deal assessors and installers, energy suppliers (that will be responsible for funding the Energy Company Obligation, providing up to £1.3bn per year), local authorities that can also have a role in promoting the Green Deal or becoming a Green Deal Provider, and the Government.

Ireland: “Small Medium Enterprise (SME) Business Programme”

The Sustainable Energy Authority of Ireland established a Small Medium Enterprise (SME) Programme or Small Business Programme in 2007 to support businesses in tackling their energy costs, partly financed by Ireland’s EU Structural Funds Programme co-funded by the Irish Government and the European Union.

The programme was also extended to cover public sector organisations. The most relevant themes of the programme are the engagement of SMEs through telephone advice and on-site assessments, building the Energy Management Action Programme (with structured energy management web resource), the development of a body of standard solutions that offer proven energy efficiency opportunities to firms at minimal transaction costs, building the energy services market through role models, case studies, dissemination, verification and capacity building and ensuring a high quality service is provided to SMEs through on-going review procedures.

The businesses involved in the programme have an energy bill of less than €500,000 per annum. For businesses with a spend in excess of €30,000 per annum, a team of experts from SEAI conduct a site visit and follow up mentoring over a three month period. For businesses with an energy spend of less than €30,000 per annum, they qualify for a phone consultation. Businesses with an energy spend in excess of €500,000 are recommended to participate in Energy MAP training or invited to engage with the Large Industry Energy Network.

A team of 20 to 30 prequalified assessors are available on demand, as most of the participants would not have the turnover or scale to employ an Energy Manager directly. The range of savings enjoyed by specific participants varies significantly, as over four fifth of participants save at least 5%, over half make at least 10% savings, and nearly a third saves more than 15%.

More information on these examples can be found on the CA ESD website at: http://www.esd-ca.eu/good-practices/member-state-presentations/energy-services and http://www.esd-ca.eu/good-practices/good-practice-factsheets/energy-services.

Concluding remarks

The energy services market spread from large industries, large buildings and groups of buildings, to single households. Contracts with energy performance guarantees are present in three quarters of the Member States, but due to their complexity, their current application is justified only over a certain threshold. For smaller/simpler contracts it is possible to include performance clauses and/or some quality assurance (e.g. integrated energy contracting).

Structured policies like PACE and Green Deal address not only the quality check, but also the typical problems of energy services, like financing, communication, etc. One quarter of the CA ESD participants consider PACE and/or Green Deal as a possible solution to boost the offer of energy services to households. Although there was a lot of interest from CA ESD participants in most of the energy services practices and policies, it was generally agreed that only a few of them are simple and easy to be implemented. Of those simple schemes the current work in Finland on guidelines to explain different procurement options and their pros and cons in the public sector was considered “very useful, attractive and easy to put in place”.

Legal Disclaimer

The sole responsibility for the content of this report lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither EACI nor the European Commission are responsible for any use that may be made of the information contained therein.

The Concerted Action for the Energy Services Directive II (CA ESD II) was launched by Intelligent Energy Europe (IEE) in May 2011 to provide a structured framework for the exchange of information between the 29 Member States during their implementation of the Energy Services Directive (ESD).

For further information please visit **www.esd-ca.eu** or contact **caesd@esd-ca.eu**

INTELLIGENT ENERGY EUROPE

CONCERTED ACTION ENERGY SERVICES DIRECTIVE