



CHANGE BEST

Energy Efficiency Services

Good Practice Business Models and
Successful Market Developments

2012

- New energy efficiency service ideas
- Business strategies and business cases
- Accelerating market growth



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Editorial information

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Executive summary

Starting up companies and business can be both exciting and enjoyable and yet at the same time extremely challenging. The ChangeBest project aimed to help in alleviating these challenges by supporting the development of new energy efficiency services (EES).

Just as every business, a new EES starts with an idea. ChangeBest supported new and existing EES providers, small and large companies, by helping their ideas to become profitable business cases. This support included a guideline (available at www.changebest.eu), advice by email, telephone and face-to-face meetings as well as information exchange between EES providers at national and European workshops. Nearly 90% of those EES providers that gave detailed information about their new EES stated that they were directly or soon reaching economic profitability during the field test phase of first market introduction. Thereby, energy savings between 10% and 80% per EES contract have been achieved.

Designing new EES that fit to the target group is often hard work and risky because there are many uncertainties and factors to consider. ChangeBest has drawn a red line for making an EES successful, for example indicating: who are the customers and what do they need? How big is the opportunity? Is the timing right? What will it take to execute? Is the return worth the risk? What is the motivation, the business model, the competitive advantage? How to finance it? What is the right marketing strategy? Where is the best available know-how?

During the ChangeBest project 48 new EES have been developed and field-tested in 16 European Member States. These new EES covered different fields of application and different customer segments. For example there were energy companies developing EES for customer segments ranging from energy-intensive industry to private households; from doing the EES alone to co-operating with private company partners and energy service companies (ESCOs). In other cases, ESCOs developed and improved new or existing EES. Some of these new EES were not

successful; others can be called good practice examples. In both cases there were important lessons learned for the EES providers.

Good practice examples in ChangeBest have been characterised by important energy savings associated with the EES, by the level of innovation and integration, by the cooperation model used, by the market addressed and by the possibility for replication. For example in the industrial sector an integrated solution for furnaces achieved high energy savings with a high level of technical innovation. In the public sector energy performance contracting (EPC) with integrated building envelope energy efficiency measures perfectly suited customer needs. In the residential sector EPC has been used for comprehensive building renovation of multifamily building, with a high level of innovation in financing and an interesting cooperation model. Other EES were tested in the tertiary sector, like for example hotels, showing interesting EES integrating renewable energies. In mass markets, energy companies were very active in developing EES in order to increase their customer loyalty and to improve their knowledge about customers' needs and priorities.

The ChangeBest project has seen that there is a large potential for profitable EES by various market actors in Europe. According to different studies and an estimate by the ChangeBest project, the EES market is expected to grow by several billion Euros per year until 2020. However, the EES market could be further accelerated by adjusting and improving the current legal framework. Public tendering rules, energy efficiency obligations or funds, effective monitoring and verification, market facilitators, increasing trust among market actors, are few of the issues that if well addressed would accelerate the EES market. In addition, ChangeBest has shown that information exchange, advice and learning from good practice can particularly help smaller or new EES providers to improve their market performance.

Introduction

Energy efficiency services (EES) can provide effective and cost-efficient energy solutions to private companies, public administrations and private households. The increase in energy end-use efficiency induced by such services is an important answer to the energy market requirements of the future. The potential for profitable EES in Europe is large, as the market in several countries is still in an initial or not well-developed stage.

Financial support for the implementation of energy efficiency improvement (EEI) actions is still important in many areas, where transaction costs and significant barriers prevent market growth. However, as Thomas Kåberger, former Director General of the Swedish Energy Agency, stated: "We have got to ... create competitive business models to deliver significant energy efficiency activities" (ecee Graffiti, 5 June 2009). Therefore, ambitious energy efficiency targets will not be met if self-sustaining energy efficiency business remains on the current comparatively low level and if markets do not further grow significantly. There seems to be the need to develop additional business strategies supported by additional policies and measures to further develop the EES market. This might include a broader implementation of already existing EES ideas and respective business models, or to develop new services that fill in some gaps in the market.

Against this background the European ChangeBest project (2009-2012) tried to understand how and to which extent the EES market could be further developed, what are appropriate business strategies and promising services not only for "advanced" companies but also for "beginners", what is a policy framework suitable to stimulate market development and to overcome existing barriers, and what role the different market actors (energy companies, ESCOs, building technology companies, etc.) could play.

This brochure presents selected results of the ChangeBest project as well as good practice business models. It also gives the opportunity of:

- Learning from strategies how to develop new EES;
- Learning from strategies how to make EES profitable;
- Learning recommendations on how to further accelerate EES market growths.

The brochure is designed to cover different fields of application and different customer segments.

A number of good practice EES concentrate on ESCOs and building technology companies developing EES for different sectors and fields of application. Other cases concentrate on energy companies developing EES for customer segments ranging from energy-intensive industry to private households; from doing the EES alone to co-operating with private company partners and ESCOs.

This brochure cannot cover all new EES developed nor all field-tests, which were carried out in the course of the ChangeBest project. Information on all ChangeBest field tests as well as more detailed overall results from the project is available at www.changebest.eu.

From EES ideas to profitable business cases

Guideline

The ChangeBest project has developed a guideline on how to develop profitable EES business cases, which has been the basis for this chapter. The full text is available at www.changebest.eu.

Definitions

The European standard EN 15900:2010 defines EES as an agreed task or tasks designed to lead to an energy efficiency improvement and other agreed performance criteria. According to EN 15900:2010, EES shall include an energy audit (identification and selection of actions) as well as the implementation of actions and the measurement and verification of energy savings. A documented description of the proposed or agreed framework for the actions and the follow-up procedure shall also be provided. The improvement of energy efficiency shall be measured and verified over a contractually defined period of time through contractually agreed methods.

A core element of each EES is thus an energy efficiency improvement (EEI) action, which is any action that directly leads to a reduction in energy consumption.

The “value chain” reflects the implementation process of an EEI action; starting from motivation and public awareness to monitoring (Figure 1).

Motivation

In developing a product for the EES market, i.e. an energy efficiency service, EES providers may pursue different goals. While some EES providers aim at achieving reasonable profits, other EES providers have different and additional motivations, such as:

- Improvement of image (as energy efficiency and climate

change have a positive connotation);

- Increasing the loyalty of the customer and thus improving the position of core products.

If these two goals prevail, the EES might be “cross-subsidised” by other business, which they support.

In the other case, when the EES provider wants to generate additional profit margins, the core of the EES has to be an EEI action, which is economically viable. In a narrow sense this means, that the cost of the action is covered by the energy savings over an acceptable period of time. In a broader sense, however, economic viability is related to the willingness of the customer to pay for a certain service.

Elements

The first constitutive element of an EES is the delivery of solutions that match customer needs. Solutions often address a specific technology or technology system of the customer (building structure; heating system; lighting system; etc.)

The second element that constitutes an EES is the target group addressed (private households, building owners; commerce & services; hospitals; schools; industry; etc.).

The element of the target group is closely connected to the element of the technology system because specific target groups are characterised by the application of typical technology systems.

Finally, the third element in designing an EES is the position in the “value chain” of the EEI action. Each EEI action consists of a preparatory phase (information, advice, planning), the core phase of implementation (physical implementation), operation, maintenance and monitoring phase. Each of these phases represents a certain “value” in terms of the achieved

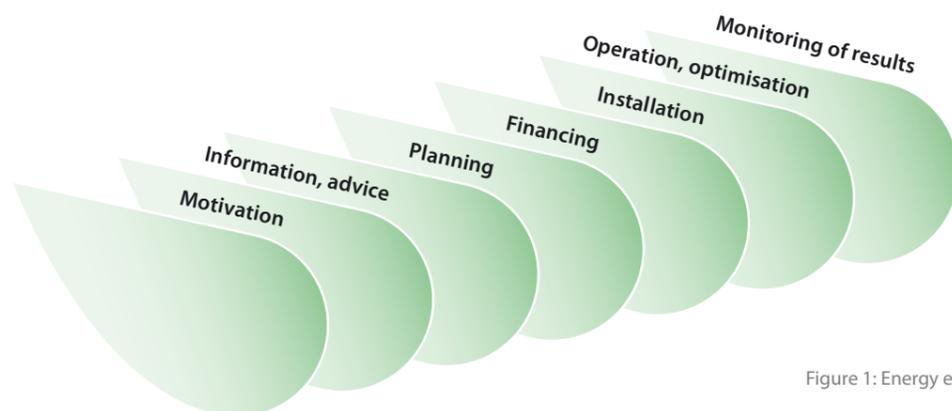


Figure 1: Energy efficiency value chain

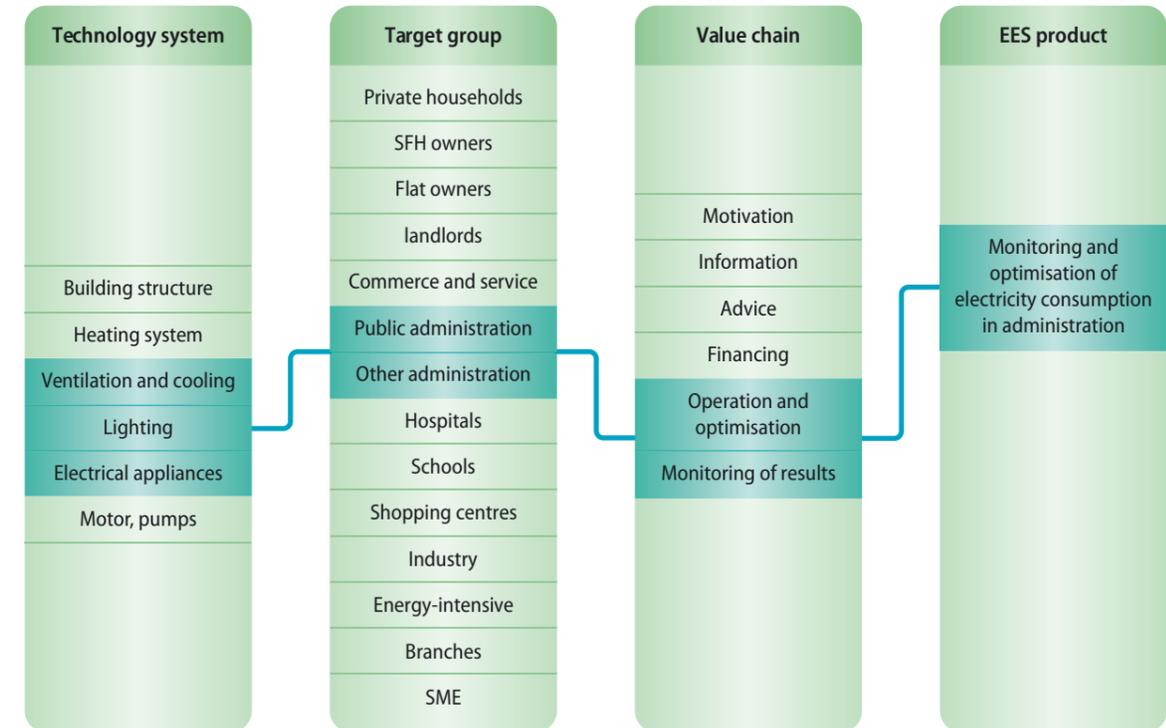


Figure 2: Example of three elements of an EES

energy savings, or in a broader sense in providing a certain service to the customer.

EES are thus characterised by the choice of a certain solution for a given customer, which often is a technical solution regarding a specific technology system; by the selection of a target group and by finding one’s position in the value chain of EEI action.

For example, a possible EES is related to monitoring and optimisation of electricity consumption in office buildings. The three elements of this example can be represented as shown in Figure 2.

Each of the elements constituting an EES reflects an important issue related to the energy service business:

- The choice of the technology system reflects the technical know-how and competence, which is available at the side of the energy supplier;
- The selection of the target group addresses the power to activate distribution channels targeting the chosen customer group;
- The position in the value chain reflects the strategic choice of the company. This is at the same time closely related to the risk associated with different phases of EEI actions.

Customer needs

The first question is: “Does the potential customer really need this EES?” In answering this question it may be helpful

to try to look at the EES “with the eyes of the customer”; for example by implementing a market analysis. The task is to identify, how much the “driving forces” behind the business of the potential customer are or could be influenced by the EES. It is obvious that the market introduction of EES is promising for situations where the customers’ core business and routines will not be disturbed by the EES actions, or even positively influenced. Therefore EES need to be developed in a way that supporting elements are put to the foreground while disturbing elements are repressed as much as possible.

Competitive advantage

The second question when “cross-checking” the development of an EES refers to the competitive advantage that the EES provider is able to exploit. This question addresses an analysis of the potential competitors and the potential elements for competitive advantage.

Links

The EES developed is usually not the only product the EES provider offers to its customers:

- The EES can be part of a bundle of services offered;
- There can be links to other business fields, depending on the type of the EES provider (e. g., to the technology business of technology manufacturers or to the energy sales of energy companies). Interlinks can be positive (e. g., economies of scope) or negative (e. g., reduced sales in the other business field).

An analysis of strengths, weaknesses, opportunities and threats (SWOT analysis) can be helpful to identify positive and negative links between the intended service and other business fields, or vice versa. In general, the SWOT analysis asks:

- Which strengths of the other business fields support the EES?
- Which weaknesses represent a barrier to the EES?
- Which opportunities does the EES offer to other business fields?
- Which threats could emerge from the EES for other business fields?

Economic viability

For the assessment of the economic viability of an EES there are specific costs items to be considered:

- Costs of energy-efficient technology;
- Energy costs including the case when: supply of energy is included within EES;
- Personnel / Man hour costs;
- Costs for external partners;
- Insurance costs;
- Taxation and in particular energy taxation;
- Imputed interest rate (costs of capital);
- Overhead costs like rent of building, office equipment, metering equipment, management and accounting;
- Transaction costs, like costs of information with regard to the degree of solvency of the customer, costs of bargaining and drawing up a contract, costs of co-ordinating the implementation of the EES, costs of measurement and verification, billing costs and market development costs.

The overall economic viability of an EES is influenced by a large number of factors:

- Related technical aspects (for example EEI measures already implemented by the customers reduce the potential for additional cost-effective EEI actions);
- User aspects like existing data and information on usage patterns;
- Property issues and transfer of ownership at the end of the EES;
- Framework conditions, like tenant laws, fire safety, air quality requirement, required comfort levels, available subsidies;
- Maturity of the market.

In general there is no economic viability of the EES if it is not beneficial to the customer. The EES provider should also calculate profitability from the perspective of the customer. This calculation can even be used as a starting point for pricing the EES.

Financing

As in every business, the start-up phase of an EES business (development, market introduction and marketing) can be costly and has to be pre-financed before the sales generate sufficient income to cover these costs.

Then, often the provision of EES is a capital-intensive business, where the degree of capital intensity depends on:

- Level of transaction costs;
- Position of the EES in the value chain;
- If the EES includes pre-financing of the investment.

However, as in other business, EES providers have a wide range of possibilities for project financing: credit financing, leasing, forfeiting, etc.

Risks

Like every other business the provision of energy services is also associated with the take-over of risks. Important risks, which are typically related to EES, are:

- Capability and degree of interest of the customer / target group into the EES;
- Degree of EES standardisation;
- Investment cost risk (related to the investment cost of the EEI action);
- Financial risks: including risk of changing energy prices and risk of changing interest rates for re-financing and pre-financing of EES;
- Contract period;
- Achievement of the guaranteed/expected energy savings;
- Compliance with existing standards;
- Maintenance cost risk;
- Security of supply of the EES: this risk is related to the functioning of the applied technical systems securing the promised quality and comfort levels;
- Risk of insolvency of the client.

Generally speaking the EES provider should aim at taking only those risks which is fully able to control. Furthermore, the longer the EES contract duration is, the more important the risk management becomes. A few rules should always be respected:

- Decide strategically on the EES portfolio: all-in-one versus selective approach;
- Carefully plan, calculate, prepare and control;
- Combine assessment of client with economic calculation of EES;
- Carefully design the EES contract;
- Plan adequate maintenance;
- Assign qualified personnel and carefully choose external partners;
- Draw on available insurances and external guarantees;
- Make use of specific instruments in international EES business.

Marketing

When developing EES the provider needs to know, besides the technical solution, how to bring his service to a customer. In particular: how to package, price, promote and sale the EES. By entering the market with an EES in a slightly different way than competitors, the EES providers can become significant players in the energy services business.

Adopting the right “marketing mindset” is a key success factor. The marketing mindset highlights the importance of not just thinking about the products or services provided, but also about how the provider, its products and services are perceived by the potential customer. In this context, the following issues are typical for the marketing of EES:

- Packaging: the combination of various services elements can help to position the EES provider as a competent partner for solving customer problems;
- Pricing: pricing is directly connected with the position of the EES on the value chain and the type of EES;
- Communication: the “marketing message” to the customer is a breakdown of the main advantages of the EES from the customers’ perspective;
- Starting point for distribution: the easiest way to introduce EES into the market usually is to start with current customers.

Solutions via a network

Integrated solutions have already been supplied for years by well-known multinational engineering and maintenance companies. They have the resources for organising complex integrated energy-saving solutions such as Energy Performance Contracting (EPC).

Small EES providers can fill their gaps working in a network of partners composed of EES suppliers (specialised in energy audits, energy monitoring, cogeneration, renewable energy, etc.) as well as players with their core business outside the

EES-market (e.g. classic engineering companies).

Best available know-how

Best available know-how is at the basis of a competitive EES. The experts working on the EES products need: easy access to all relevant material information sources and regular specialised technical trainings.

When possible, senior experts from relevant domains should be invited to give top level expert feedback on the project. The typical ‘we-know-it’ attitude needs to turn in a positive open attitude.

Innovation

If the competition in the market for EES-products becomes price-based only (often the case for basic EES like energy audits), the supplied EES often have a rather poor quality and generate low profit margins for the EES supplier and low added value for the client.

One way of increasing the margins of the EES supplier is the development of innovative EES with a high added value. Thus, instead of trying to compete with other EES suppliers via decreasing prices and with small adaptations of the supplied products in the existing markets (the so-called ‘red oceans’) the EES suppliers should think of creating new ‘blue oceans’ where they would be the first supplier that offers innovative products with high added value at a good price.

Professionalism

Although professional management of projects is evidently beneficial, the daily practice shows that a large part of EES providers do not, or only partially, fulfil it. For entering quality oriented markets, professional management is a key quality of the EES provider.

Client oriented

The EES provider has to focus more and more on customer needs. This appears self-evident but it requires an important mental shift. Often experts of EES providers are more oriented to advanced technical reports and calculation procedures. For example an outstanding energy audit that is not accepted by the customer does not generate any energy saving effect and hence no added value, either.

Overview of the field tests

The main objective of the ChangeBest project was to support the development of marketable and successful EES.

For this reason, the ChangeBest project team has developed a guideline to support strategic EES product development. This was tested by the ChangeBest practice partners including ESCOs, energy companies and other firms.

Business cases with EES field testing have been carried out in order to find new or optimised EES that contribute to filling observed gaps on the EES markets and increase the total EES market.

A "new" EES in ChangeBest is an EES that is either new for the respective country or target group, an optimisation of an already existing EES (e.g., by using new technology), or a completely new product in the European market.

In total, 38 partners from practice were participating and implementing 48 field tests in 16 European countries. Each of the practice partners was testing between one and four EES.

The practice partners are a nearly equal mixture of energy companies, ESCOs and other companies (technology providers, consultancies, engineering companies, a project or EES facilitator and an association) (Figure 3).

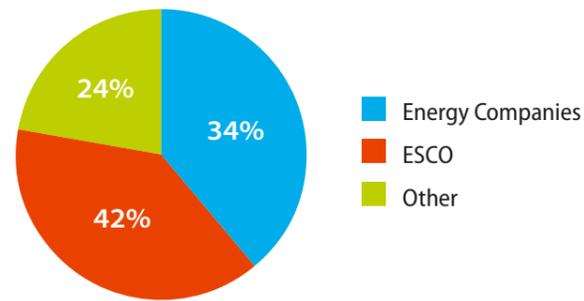


Figure 3: Type of EES provider

Nearly 50% of the EES providers in the ChangeBest project have less than 30 employees (small). Another 32% are big companies with more than 200 employees (Figure 4).

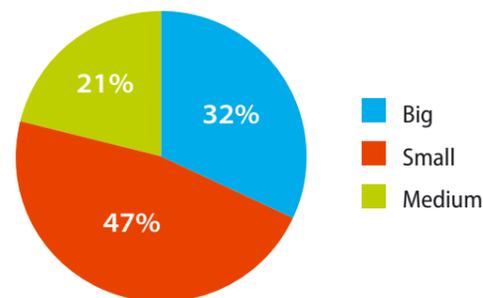


Figure 4: Size of company

The ChangeBest project worked as a platform for interaction between companies having already experience in the EES market and newcomer. As shown in Figure 5, the partners from practice are a well-balanced mixture of know-how.

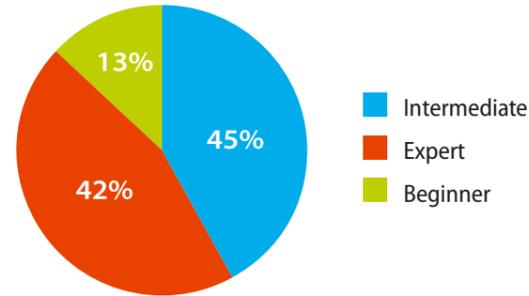


Figure 5: EES market experience of the practice partner

In the field testing there were four types of EES:

- Energy Performance Contracting (EPC);
- Other full EES that are not EPC;
- Heat & cold delivery service models;
- Partial services connected to EES.

In countries with white certificate schemes, there can be different types of EES generating savings for which certificates can be gained. These EES in white certificate schemes have been a separate category within the ChangeBest project.

EPC is always considered to be an EES covering the full value chain; while other full EES meet all the criteria of EN 15900:2010.

Heat & cold delivery service models can be a full EES; when the service includes an audit to identify energy-efficient solutions for the customer, the implementation of EEI actions and the ex-post monitoring to check the energy savings. Pure selling of new technologies without a service is neither an EES nor a partial service connected to a complete EES.

Partial services connected to EES just include parts ("components") of the EES value chain, like for example energy audits, but are designed to directly or indirectly lead to energy efficiency improvements. For example, energy audits together with a strong motivation and service offer for the customer to implement the identified EEI measures in the audit with the help and support of the EES provider or other market actors can be considered a partial service connected to EES.

However, practice partners implementing partial services connected to EES have been motivated to check for additional services, such as offers for implementation and monitoring, which could improve their service to become a

"full EES" with possible advantages in marketing the product.

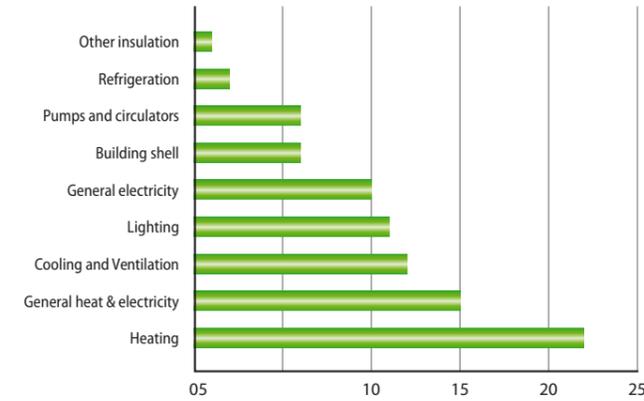


Figure 6: number of field test by types of EES

A good share of the field tests (16) are EES as a partial service, while 19 field tests follow the ESCO model for EPC. The remaining field tests are EES in white certificate schemes or delivery of heating or cooling (Figure 6). These field tests are spread nearly equally on four customer segments: private households, public buildings, private tertiary and industry.

The different EES products and ideas belong to nine fields of application and technology (Figure 7). Most of these are related to heating, cooling and ventilation. These are followed by electricity savings in general, lighting and building shell.

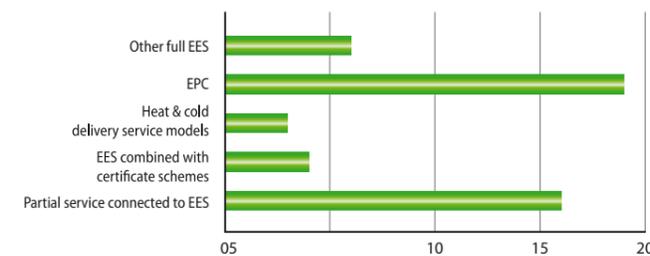


Figure 7: Field test by field of application

Each field test includes different parts of the EES value-chain, from rising customer awareness up to monitoring and verification. With a classical EPC, most of the actions are carried out by the EES provider. The ChangeBest project is a showcase of a great variety of combinations. In some cases, parts of the EES actions are implemented by the customers. Sometimes for one action, such as installation, operation or optimisation of a system, different stakeholders are involved.

Most of the practice partners cooperate with external companies. This might be a commercial bank for third party financing, a technology provider, consultancies or engineering companies.

If a new business is started or a new product is offered, effective marketing is crucial for its economic success. With most of the practice partners, CEO and sales department are involved in the marketing and therefore the new EES has top priority within the company (Figure 8). But other

external experts were involved as well. Some of the partners had positive experiences with word-of-mouth marketing by installers and support by a large energy company. Some had the chance to get promotion by public bodies.

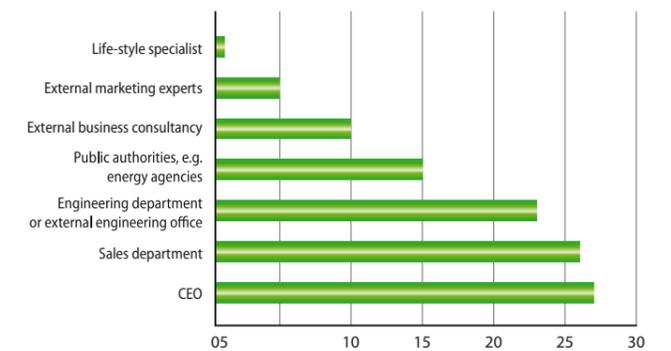


Figure 8: Players in EES marketing

An essential goal of the ChangeBest project was the economic profitability of the EES. The majority (67%) of all EES providers participating in ChangeBest and nearly 90% of those providing profitability figures stated that their new EES were directly or soon economically profitable during the field test phase (Figure 9).

This is an encouraging result for all interested parties thinking about offering new EES products to their customers.

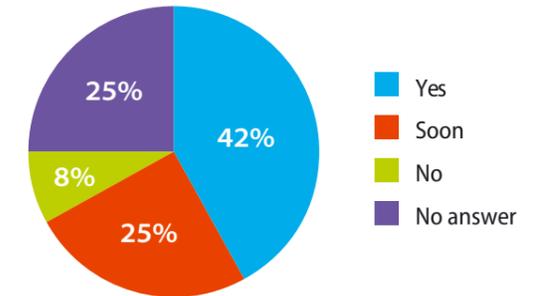


Figure 9: Is your EES economically profitable?

Although it seems that experienced practice partners have a higher likelihood to develop a profitable EES business, 80% of the beginners were also offering a profitable EES or hoping to reach the break-even point soon.

The energy savings achieved in the field tests ranged from 10-80% per contract. Table 1 gives an idea of the savings potential per EES. Beyond that in some EES heat and steam were saved too.

Range of energy savings per EES contract in kWh	from	to
Electricity	90	680,000
Natural Gas	3,000	1,600,000
Oil	18,300	380,000

Table 1: Range of savings per EES contract

The following lessons learnt have been suggested by the ChangeBest partners from practice to foster the EES business:

- For the customers it is important to have a simple and easy-to-understand product (elements, cost, packages);

- The contracts have to be fair, transparent and must be explained carefully and in details;
- The most important factor is to communicate "trust" to the customer;
- A successful example has a significant replication impact;
- A close and good relationship of the staff to the customer and a good know-how of the customer's situation are important for success;
- Identify the benefits for your partners early and anticipate where conflict of interest could raise up;
- Careful preparation by strategic seminars involving specialists on customer segment analysis, lifestyle and communication is important;
- A good measurement and verification plan is necessary;
- Customers in general appreciate the offer of EES, but saving guarantees is a very important aspect;
- With EES in public authorities, it is important that the municipality has an internal organisation capable of managing the workload of the EES project (e.g., an EPC).

Good practice examples

Good practice examples

The primary focus of the ChangeBest project was to facilitate and support the development of new EES. In the framework of the project 48 new EES were field tested. This was 31% more field tests than originally planned, which indicates a strong interest from market players to develop and provide new EES.

Some of these new EES can be considered a good practice example with a high potential for replication and energy efficiency level. In this brochure seven good practice examples have been selected and further described.

The good practice examples have been selected by applying the following criteria:

- Large amount of saved energy;
- Innovative solution;
- Good newcomer;
- Good integration of renewable energies (integrated EES);
- Interesting cooperation model;
- Dealing with difficult markets:
- Customer groups, e.g. mass markets,
- Public buildings,
- Not well developed local frame conditions.
- Feasibility of the “business model” in terms of EES contract sales;
- Possibility for replication of the EES by other EES providers and in other countries.

The amount of saved energy is certainly an important factor of every EES. However, there are other aspects to be considered that characterise whether an EES is successful or not in the market. For example, the provision of innovative solutions with a smart combination of services and energy efficiency actions bring an important added value to the customer.

New companies, which started their business just few years ago, as well as newcomers, showed that they can be very successful in the EES market. Integrated EES, where the EES includes a combination of energy efficiency improvement measures and renewable energies, are sometimes easier to sell, particularly in southern European countries.

A challenging customer group are public authorities, as the EES has to be selected by a tendering process. Some of the practice partners had to deal with difficult framework conditions. The mass market characterised by

high transaction costs was identified as a difficult customer segment as well.

In some countries the development of the EES market has just started with sometimes challenging legal conditions.

The following examples cover different fields of application and concepts. The customer segments range from energy-intensive industry to private households. Some EES providers do the EES alone or co-operate with external partners.

CMI Greenline Europe - France

The company’s mission is to perform fully integrated solutions for thermal processes in the process industry including expertise, engineering, equipment supply, commissioning, and leading to an energy saving performance guarantee. Many references show that dedicated expertise with numerical simulations allow predicting and reaching significant savings along with increased performances and reduction of pollution emissions.

The field test showed a high absolute amount of energy savings in a customer segment which is rarely targeted by EES providers.

Eltec Petrol, d.o.o. - Slovenia

This company field tested EPC with integrated building envelope energy efficiency measures as an answer to the needs of the customers in the public sector. This example shows the high potential of energy savings in these buildings being unlocked by external knowledge and capital.

EnerEfficiency – Portugal

An easy and quick to install mimicking equipment simulates the real temperature of the products inside commercial refrigerators/freezers, and regulates the refrigeration temperature accordingly, thus saving electricity. This innovative small scale EPC shows that also newcomers can be successful in the EES market with a product which has an excellent cost benefit ratio.

RENESCO - Latvia

This company field-tested an EPC model for comprehensive energy efficient renovation of multifamily residential buildings, which is ideally suited for the housing conditions in Eastern Europe. This model takes all the financial and technical risks and decision-making away from the flat owners and realises high amounts of savings.

The innovative cooperation model includes financing (forfeiting) and involvement of house maintenance companies collecting the EPC rates.

Dalkia - Spain

This company field-tested energy-efficient fuel switching using biomass for sanitary hot water production and pool heating for hotels. This is a good example of integration of energy efficiency improvement measures with renewable energies. It offers the opportunity for the customer not only to save money but also to underline a green attitude.

Lokalenergi - Denmark

Based on a detailed customer segmentation analysis, the project provides a new and innovative long term strategy platform for EES offers. This continuous dialogue with the customers leads both energy savings and customer retention. The customer can “book” infra-red photography, a mini energy audit, reduced stand-by consumption, an energy efficient circulation pump, lamps, cooker and refrigerator and ESCO renovation of the building. This field test shows how to successfully deal with mass markets.

StadtwerkeTübingen GmbH – Germany

This utility company field tested the installation of a high-efficient circulation pump with payment via the customer’s electricity bill over a period of four years. This standardised small investment is easy to handle for customers. It is implemented in cooperation with local craftsmen. Therefore, it is a good example especially for local markets to gain potential competitors as partners instead of putting a high effort to increase the know-how of the company to offer the new EES.

1 Complete energy efficiency services and engineering for the processing industry

CONTACT DETAILS

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FRANCE

THE CASE IN BRIEF

Fully integrated solutions for thermal processes in the process industry including expertise, engineering, equipment supply, commissioning leading to a guaranteed energy saving performance

EES PROVIDER TYPE

Technology provider

TARGET GROUP

Industry

FIELD OF APPLICATION

All thermal processes including furnaces

Description of the EES

The first activity of this EES, proposed by CMI Greenline Europe, is a detailed mechanical and thermal numerical simulation of the existing industrial process. Based on this study CMI Greenline proposes an adapted and optimized solution based on the best available technologies for improving energy performance and productivity. CMI Greenline adds or upgrades the process control models, modifies the equipment design, changes the burners, installs a heat recovery system and implements all other necessary improvements.

What is new and innovative in this service is the capability of CMI Greenline to guarantee an energy savings performance based on an initial audit of the process and to subsequently implement successfully the solution.

Benefit to the customer

Typically energy savings of at least 20 % and an increase of productivity of 10 % are achieved. The amount of absolute energy savings is outstanding.

Value chain

Information, energy audit, advice, feasibility study, technical planning, project management, installation of technical systems/components, optimisation of the operation, verification / monitoring.

EES provider's role

Information, energy audit, advice, feasibility study, technical planning, project management, installation of technical systems/components, optimisation of the operation, verification / monitoring.

EES customer's role

Operation.

Economic viability

With rising prices of energy and much stricter environmental regulations, CMI Greenline's projects bring attractive return on investments.

Such projects are also subject to subsidies and are good candidates for financing packages from banks or third party investors.



Total investment costs

The total investment costs depend on the project scope.

Contract duration

One year.

Energy savings

In the range between 20 to 30%.

Guaranteed savings

Yes, savings and product quality are guaranteed.

Sources of investment of the equipment

By the customer, a bank or another financial service.

Sources of income

Customer payment, government grants and white certificates.

Lessons learned and recommendations

CMI Greenline acquired a company specialised in heat treatment, to further reinforce its expertise and to be able to enter the automotive and aeronautic markets quicker.

The commercial procedures and production technical standards are specific although the energy problems and solutions are similar for each type of industry.

2

Energy Performance Contracting (EPC) with integrated building envelope energy efficiency measures

CONTACT DETAILS

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SLOVENIA

THE CASE IN BRIEF

As one of the first companies in Slovenia Eltec Petrol started to offer EPC with integrated building envelope energy efficiency measures as an answer to the needs of the customers in the public sector

EES PROVIDER TYPE

Technology provider

TARGET GROUP

Public administration in general, schools and kindergardens, sports halls, swimming pools, hospitals

FIELD OF APPLICATION

Building shell, general - heat & electricity

Description of the EES

The EES offered by Eltec Petrol represents a comprehensive approach to the implementation of energy efficiency measures. All energy systems as well as the building envelope are thoroughly investigated during the auditing phase; technically and economically feasible energy efficiency measures are then proposed for implementation. Measures are related to different energy systems (heating, air-conditioning, ventilation etc.), as well as water consumption and the building envelope. These measures can vary from an optimisation of existing systems and installation of energy management system to the replacement of boilers and inefficient pumps, the introduction of heat recovery systems, the change of energy source (also to RES), thermal insulation of attic etc.; everything according to the situation of individual customer. Training of users is an integral part of this EES, and also the change of behaviour has an impact on achievement of the guaranteed energy savings and overall success of EPC projects.

EPC projects with integrated building envelope energy efficiency measures are not new on a European level, but for Slovenia this is the first time that EES like this has been offered. This new product is for Eltec Petrol a logical upgrade of the EES offered before and also an answer to the needs of the customers in the public sector.

Benefit to the customer

Customers buying this EES benefit first of all from a comprehensive approach to energy efficiency measures implementation with guaranteed energy savings. Besides that EPC has also other positive effects for the customer: living and working conditions are improved, the operation of energy systems is more reliable, the perception of the customer in public becomes "greener" - energy efficient and environmentally friendly etc. The public administration can demonstrate that public buildings have cost optimal energy performance.

Value chain

Motivating/raising customer awareness, information, energy audit, advice, feasibility study, technical planning, project management, financing, installation of technical systems/components, operation, optimisation of the operation, verification and/or monitoring.



EES provider's role

Motivating/raising of customer awareness, information, energy audit, advice, feasibility study, technical planning, project management, financing, optimisation of the operation.

Economic viability

The margin for EPC projects is generally low, but long-term contracts make the business attractive.

Total investment costs

No data provided.

Contract duration

Fourteen years.

Energy savings

€60,174 per year in the EPC field test.

Guaranteed savings

Yes, savings are guaranteed.

Sources of investment of the equipment

By a bank or other financial service.

Sources of income

Customer payment.

Lessons learned and recommendations

The development of new EES in Slovenia is still hindered by the immaturity of the EES market with only a few providers, not enough support from high political level and often not interested potential customers.

EPC projects are rather complex, so good technical, organisational and project management skills are needed. The main factors of success are good and open communication with the customer, well planned and implemented energy efficiency measures, information and motivation of users, introduction of easy to handle energy management system and a transparent calculation of the costs baseline and energy savings. Inclusion of the building envelope energy efficiency measures into an EPC project should be carefully checked and designed. A possibility to allocate client's own financial means next to the achieved costs savings for a comprehensive energy efficient approach should be considered.

For the public administration, tendering EPC including both building envelope measures as well as building technology equipment can involve a risk. Since the building envelope measures will cover the largest part of investment, such a tender could attract building companies that have no or only little knowledge on building technology, thereby deteriorating the amount of energy savings achieved. Therefore, the tendering procedures have to be carefully designed.

ELTEC **PETROL**

EnerEfficiency staff is responsible for the monitoring of the refrigeration system.

The word refrigeration to be changed with refrigeration

3

Energy Efficiency for Refrigeration Systems

Description of the EES

This EES includes the installation of a mimicking device in refrigerator/freezers. The installation is quick and can be carried out during operation of the refrigerators. The existing sensor of the refrigerator/freezer is inserted into the eCube box. This device allows the sensor to read real food temperature rather than the fluctuating air temperature inside the systems. In this way the frequency of refrigeration cycles is reduced, while keeping the food temperature as needed. Thus, the lifecycle of the refrigeration system is increased while energy consumption is reduced.

EnerEfficiency staff is responsible for the monitoring of the refrigeration system. Usually, EnerEfficiency installs energy power meters in the switch board of the refrigeration system one week before the installation of the eCube. In this way ex-ante energy consumption is monitored. The power meters remain there for another week, after the installation of the eCubes. In some cases, the monitoring period is extended in order to avoid the interference with batch cycle processes. Online monitoring is also possible. No additional equipment is necessary.

The savings achieved are usually high but there is an unpredictable factor related to the maintenance status of the refrigeration network that can have a negative influence in the savings achieved. For example, refrigeration gas leaks, which were not perceptible before the eCube was installed, affects the results. In addition, during the monitoring period, the customer should not connect additional loads in the same circuit where the eCubes have been installed.

The customer receives a report of the measurement campaign and is requested to register and send their temperature data, which is also analysed by EnerEfficiency in order to check if there are any temperature outside the food temperature regulations range. In larger facilities, an online monitoring equipment is installed in order to have instant access to the energy consumption data.

The eCube is certified by NSF at International level and it is also certified by Portuguese ISQ.

This product has been promoted in a DSM campaign, which was a driver for the success of the implementation of the service.

Benefit to the customer

Large immediate energy savings with a relatively low investment.

Value chain

Motivating/raising customer awareness, information, energy audit, web-based quick-checks, feasibility study, technical planning, project management, financing, verification / monitoring.

EES provider's role

Motivating/raising of customer awareness, energy audit, feasibility study, technical planning, verification / monitoring.



EES customer's role

Web-based quick-checks and operation.

Economic viability

The profitability for the company is between 20-30%. Cooperation with the Portuguese electrical utility was very important for the acceptance of the service by the customers. The fact that there was a co-financing was also very important for the success of the service.

Total investment costs

€8,500.

Contract duration

Two years.

Energy savings

Largely dependent on equipment power. Energy savings can vary from about 800 up to 25,000 kWh/eCube per year.

Guaranteed savings

Yes, savings are guaranteed.

Sources of investment of the equipment

By EnerEfficiency, by a bank or other financial service, DSM national programme.

Sources of income

Customer payment, brokerage, consultancy in energy efficiency and renewable energies.

Lessons learned and recommendations

Co-financing from the DSM campaign was determinant for the success of this EES.

The vast majority of potential customers for this service outsource the maintenance of their installations. The lobby of Operation and Maintenance (O&M) companies is very strong in Portugal. Since the eCubes installation typically decreases the maintenance needs of the refrigeration systems, there are split incentives between the two agents. O&M companies could be a good vehicle to increase the sales of this EES by recommending the device. However, cooperation with O&M has been very difficult and not very pro-active. Often, O&M are actually a barrier because they fear a decrease in their profit due to lower maintenance activities.

The involvement of O&M is very important. In Portugal, it seems that this sector is very close to outside collaboration. Giving them interesting royalties, like a percentage of the sales in return of new customers for the eCubes could be a good solution in the beginning to enter in their market.

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PORTUGAL

THE CASE IN BRIEF

Monitoring and audit service with a mimicking device simulating the real temperature of the products inside the refrigerators / freezers.

EES PROVIDER TYPE

ESCO (pure service provider)

TARGET GROUP

Schools and kindergardens, hospitals, hotels and pensions, restaurants, industry

FIELD OF APPLICATION

Refrigeration



4

Save your house by saving energy!

CONTACT DETAILS

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LATVIA

THE CASE IN BRIEF

The RENESCO EPC model for comprehensive energy efficient renovation of multifamily residential buildings is ideally suited for the housing conditions in Eastern Europe. This model takes all the financial and technical risks and decision-making away from the flat owners and places them with a professional third party.

EES PROVIDER TYPE

ESCO (pure service provider)

TARGET GROUP

Flat owners of multifamily buildings

FIELD OF APPLICATION

Heating and domestic hot water

Description of the EES

RENESCO is the first company in the Baltics to utilise EPC for comprehensive energy savings renovations in multifamily residential buildings. The full process for one building takes about 12 months:

- Pre-selection of buildings and Cost-Benefit Analysis;
- Resident principal approval of an EPC (majority of flat owners decides);
- Energy and technical audits;
- Project design and signing final EPC;
- Application to subsidy;
- Tender for construction works;
- Actual construction work;
- Building into exploitation and receipt of subsidy.

The services comprised in the concluded EPC are carried out with a network of companies. RENESCO is the principal contractor and responsible for supervision and quality control.

RENESCO takes all financial and technical risks in building comprehensive renovation. RENESCO brings in commercial financing and uses forfeiting.

Benefit to the customer

This EES allows customers to buy a comprehensive renovation:

- without having to take loans;
- with guaranteed comfort level;
- with a guarantee that during the whole contracting period they will pay for the same amount of energy as if the building had not been renovated. In some case profit share schemes would even lower the expenses.

At the end of the contract heating bills will drop by 50% or more.

Value chain

Full value chain.

EES provider's role

Motivating/raising customer awareness, information, feasibility study, technical planning, project management, financing, verification and/or monitoring.

RENESCO cooperates with a network of partners.



Economic viability

The EES is economically viable and the margins on long terms are good. The economic availability is currently based on the availability of subsidy, which for comprehensive renovation is needed. The service can still be provided without subsidy, but reducing the investment in aesthetical measures (for example plastering and painting of staircases), integrating energy delivery and in cities with the highest heat energy tariffs. Alternatively additional payments from flat owners are needed.

Total investment costs

€168,000 for the pilot project. On average 100-110 €/m2.

Contract duration

Twenty years.

Energy savings

€16.000 per building and year on average.

Guaranteed savings

Yes, savings are guaranteed.

Sources of investment of the equipment

By a bank or other financial service, by a guarantee scheme, availability of grants (up to 45% of the upfront investment costs).

Sources of income

Customer payment.

Lessons learned and recommendations

The most important factor is to communicate "trust" to flat owners. Case studies, success stories and good company reputation are indispensable for dealing with this customer segment and field of application.

The ESCO must be very transparent. The EPC needs to be explained in details, clearly showing profit margins and economic simulations of future energy bills applying the methodology enforced by the EPC.

Professional cooperation partners are necessary in this interdisciplinary field, which is energy efficient building renovation. Moreover, a good co-operation with the local house managers is crucial for the success.

Innovative financing mechanisms like forfeiting can help.



5

Energy efficient services development in Canary Islands hotels

CONTACT DETAILS

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SPAIN

THE CASE IN BRIEF

Energy-efficient fuel switching using biomass for sanitary hot water production and pool heating (energy supply contracting)

EES PROVIDER TYPE

ESCO (pure service provider)

TARGET GROUP

Hotels

FIELD OF APPLICATION

Pools water heating and DHW

Description of the EES

DALKIA Energia y Servicios is one of the first companies using energy supply contracting with biomass for energy efficiency improvements in buildings.

The main characteristics of the EES are:

- Selection of hotels with potential biomass demand;
- After the contract is signed DALKIA supplies the biomass replacing the conventional fuel as well as the acquisition, installation, operation, and maintenance of new equipment for sanitary hot water and pools water heating (secured price of biomass over the duration of the contract);
- The hotels benefit from a lower fuel cost (biomass) with new facilities and more comfort;
- Spanish government (National Energy Agency, IDAE) provides soft credits to biomass new installations to ESCOs, with a requirement of at least 10% energy savings;
- Biomcasa programme provided 1.0M € for these new installations.

Benefit to the customer

ESCO finances the project and assumes the risk.

Value chain

Motivating/raising customer awareness, information, energy audit, advice, feasibility study, technical planning, project management, financing, installation of technical systems/components, operation, optimisation of the operation, verification / monitoring.

EES provider's role

Motivating/raising customer awareness, information, advice, feasibility study, technical planning, financing, installation of technical systems /components, operation, verification / monitoring.

Economic viability

Economic viability depends on several factors and one of the most relevant is the biomass price.



Total investment costs

€2,980,000

Contract duration

Ten years.

Energy savings

€438,000 per year (12 hotels).

Guaranteed savings

Yes, savings are guaranteed.

Sources of investment of the equipment

By Dalkia Energia y Servicios, financial support as a friendly credit by Spanish Government (IDAE).

Sources of income

Customer payment.

Lessons learned and recommendations

Replacing propane by biomass requires new logistic for biomass, new equipment, and new elements for transport, storage and combustion.

The use of biomass is always advisable due to:

- Its environmental friendly characteristics;
- It is a renewable source of energy;
- It is an indigenous resource.

This is very important especially for the hotels placed in tourist area, as for the Canarian Islands.



6

Strategic energy efficiency dialogue

Description of the EES

The strategic dialogue based on a detailed customer segmentation analysis includes questionnaires dealing with customers' needs, feedback from consultants and campaigns. First campaign: "Save 500 kWh/year and participate in a competition" and second campaign "Provide ideas for local EES projects presented by an app with voting at the web site". The campaigns enrol more customers. In the dialogue the customers are offered an umbrella of EES offers including infra-red photography for improved insulation, mini energy audit, reduced stand-by consumption, energy efficient circulation pumps, LEDs, cookers and refrigerators and complete refurbishment of the building within an EPC.

The success factors are continuous dialogue with the customers, the realisation of energy savings and increased customer retention.

Benefit to the customer

The energy company will gradually obtain more knowledge about the customers' needs and priorities allowing the energy company to provide appropriate offers to the customer.

Value chain

Motivating/raising customer awareness, Information, Energy Audit, Advice, Web-based quick-checks, Feasibility Study, Technical Planning, Project Management, Financing, Installation of technical systems/components, Operation, Optimisation of the operation, Verification / Monitoring

EES provider's role

Motivating/raising customer awareness, information, energy audit, advice, web-based quick-checks, feasibility study, project management, verification / monitoring

EES customer's role

Active energy saving and entertaining lifestyle experiences.

Economic viability

It is a new platform including many types of EES. It is not possible to measure the economic viability before some years of activity have passed.

Total investment costs

Lokalenergi investment in the strategic dialogue campaigns is a long time investment with a yearly budget for enrolling more customers in their umbrella of different EES and secondly to obtain customer retention.

Lokalenergi is not able to provide the size of the yearly investment for business reasons.

The investment in the various EES activities are all financed as a part of the EES activity; the size of the investment is very different due to the nature of the EES.



Contract duration

Participation in the dialogue activities is without a contract while the contract duration for the umbrella of EES activities depends on the kind of EES activity.

Energy savings

In the first campaign more than 800 customers joined the EES activity and fulfilled the energy saving commitment with an average saving of 675 kWh, which was 35% better than the commitment of 500 kWh.

The infra-red photography EES, with 22 projects, was evaluated and showed that seven participants have already implemented the energy saving recommendation, while 15 still consider the results and some have used the results in sales information (sales of the house/apartment).

Guaranteed savings

The single actions in the EES umbrella such as infra-red photography or mini audit reveal saving options and payback time; an agreement to guarantee to savings could be signed but that is not the norm.

Sources of investment of the equipment

By Lokalenergi, by a bank or other financial service, by the customer

Sources of income

Customer payment, government grants, improvement of customer loyalty

Lessons learned and recommendations

The first campaign was successful with 800 participants. The goal is to considerably increase the number of participants with new campaigns and activities. The second campaign started in November 2011 (no evaluation results yet). The activity has increased the customer loyalty.

The field test has been successful due to careful preparation by strategic seminars involving specialists on customer segment analysis, lifestyle, communication and EES.

CONTACT DETAILS

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DENMARK

THE CASE IN BRIEF

Based on a detailed customer segmentation analysis, the project provides a new and innovative long term strategy platform for B2C EES offers, increases customer loyalty and improves the energy company's knowledge about the customers' needs and priorities.

EES PROVIDER TYPE

Energy Supply and Distribution Company - electricity

TARGET GROUP

Single family house owners, flat owners, Tenants (private)

FIELD OF APPLICATION

Lighting, Pumps and Circulators, Heat pumps, Heating and DHW, White appliances, Washing machines and dryer, Building shell.





Circulation pump exchange programme B2C

CONTACT DETAILS

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GERMANY

THE CASE IN BRIEF

Installation of an energy-efficient product with payment via the customer's electricity bill over a period of four years

EES PROVIDER TYPE

Energy Supply Company – electricity and natural gas

TARGET GROUP

Single family house owners, Tenants (private)

FIELD OF APPLICATION

Circulation Pumps

Description of the EES

This EES exchanges old inefficient circulation pumps with a high efficient circulation pump that saves up to 80% of electricity. It is a standard product with the same payment for all customers. Remuneration for the EES provider via the steady electricity bill is within four years. The idea of the EES is that a non-visible part of the heating system gets more attention. The electricity bill shows an obvious reduction in consumption after the second year.

The marketing efforts have been very successful. Because of the unique selling position with this EES, the supra-regional attention increased significantly.

The contract design was simple, but the circulation pump installers partly tried to encroach the programme for their advantages (for example by trying to increase prices too high).

The payment design as part of the energy supply bill was easy and understandable for the customers.

Benefit to the customer

Savings of electricity of 10% in the long term.

Value chain

Motivating/raising customer awareness, information, advice, financing, installation of technical systems /components.

EES provider's role

Motivating/raising customer awareness, financing.

EES customer's role

Operation.

Economic viability:

Margins are low, but high customer retention will be reached. Merchandising to supra regional markets margin from the standard electricity business is an additional income.

Total investment costs

€300 per pump.



Contract duration

Four years.

Energy savings

250,000 kWh per year (400-800 kWh per year per circulation pump).

Guaranteed savings

No guaranteed savings.

Sources of investment of the equipment

By Stadtwerke Tübingen GmbH.

Sources of income

Customer payment, energy sold.

Lessons learned and recommendations

Customers are very open for simple standard process products. They appreciate the efforts of the utility.

For the implementation process partners are needed with similar interest over a mid- to long-term period. Identify the benefits for the partners early and anticipate where conflict of interest could raise up.

For energy supply companies: First try to find the supporters in the management board of the company.

Other municipal utilities in Germany now have similar programmes; so the programme seems to be easily replicable.



List of field tests

Country	EES provider	EES	Main story
Energy Performance Contracting			
CZ	ENESA a.s.	EPC nurseries, primary schools and high schools	EES in school buildings including comprehensive measures within heating and general use of electricity and water. Enesa is extending its services by including new emerging energy saving and RES technologies into projects.
CZ	SIEMENS	Maximize Efficiency!	The project "Maximize Efficiency – EES" includes reconstruction of the district heating in the Moravia-Silesia region. The project includes public buildings like hospitals, social care, public schools. The EES includes wide range of measures: new BMS (building management system), IRC (individual remote control), thermostatic valves, water savers, lighting retrofit. The project includes sales of receivables.
DK	Schneider Electric Buildings Denmark	Introducing EPC on the Danish municipality market	Introducing private ESCO in Denmark with holistic EPC business model focusing first on public administrations and then expanding business to large building complexes, like state buildings, hospitals and multi-family houses.
EL	Alteren Energy and Environment S.A.	EES measures in a Hotel	Combination of heating, cooling and lighting measures, based on an energy audit. The main focus is on the installation of solar thermal collectors and new type of biomass boilers for space heating and domestic hot water in hotels. The EES aims at reducing fuel costs by 75%.
EL	Alteren Energy and Environment S.A.	EES measures in Sports Centers	Based on an energy audit, fuel switching using RES for swimming and exercising during the winter with the power of the sun for domestic hot water, pool water and space heating, guarantees energy savings.
EL	HELESCO S.A.	Third Party Financing of biogas plants	100% Third Party Financing of a biogas plant for the generation of heat and electricity from the anaerobic digestion of agricultural wastes.
EL	HELESCO S.A.	Third Party Financing of cogeneration plants	Third-Party Financing of a cogeneration or tri-generation plant for the generation of electricity, heating and cooling.
EL	HELESCO S.A.	EPC with low-cost energy efficiency measures	Almost no Energy Performance Contracts in Greece.
ES	CLECE	ESCO pilot project for Spanish Public Administration (MITYC)	First ESCO project in Spain out of 2.000 ESCO tenders planned by the Spanish government.
ES	DALKIA ENERGIA Y SERVICIOS	Energy efficient services development in Canary Islands hotels	Energy-efficient fuel switching using biomass for sanitary hot water production and pool heating (energy supply contracting).
ES	DALKIA ENERGIA Y SERVICIOS	Improving heating service development in primary schools	Energy-efficient fuel switching using biomass boilers for primary schools (energy supply contracting).
FR	CMI Greenline Europe	Complete energy efficiency services and engineering for processing industry	Full integrated solutions for industrial processes including expertise, system optimisation, engineering, equipment supply, commissioning and an energy saving performance guarantee.
FR	Ergelis	EPC service based on a quick audit and a permanent and automated help in operations, paid from the savings	Ergelis provides an innovative EPC service based on a quick audit and a permanent help in operations, paid from the savings.
IT	Habitech	Local adaptation and test of an EPC standard model for public and private buildings	Market and project facilitator providing public administrations with the expertise needed for the preparation of public tenders based on a locally adapted and tested EPC model. Extension of the model to private buildings is planned.
LV	RENECO	Save your house by saving energy!	The RENESCO EPC model for comprehensive energy efficient renovation of multifamily residential buildings is ideally suited for the housing conditions in Eastern Europe. This model takes all the financial and technical risks and decision-making away from the flat owners and places them with a professional third party with a performance guarantee.
LV	KER – climate energy solutions	Buy energy, but start saving your energy from us.	ESC combined with EPC in industry.
PT	Arquiservice	Energy Efficiency Renting for Shops	Comprehensive lighting service including retrofit of the lighting system by replacing conventional light sources with LED technology, and providing additional services such as online monitoring, and preventive and corrective maintenance. Additional advantages include end-use consumption characterisation, lower maintenance and lower air conditioning costs.
PT	EnerEfficiency	Energy Efficiency for Refrigeration Systems	Monitoring and audit service with a mimicking device simulating the real temperature of the products inside the refrigerators / freezers.
SI	Eltec Petrol, d.o.o.	Energy Performance Contracting (EPC) with integrated building envelope energy efficiency measures	As a first company in Slovenia Eltec Petrol started to offer EPC with integrated building envelope energy efficiency measures as an answer to the needs of the customers in the public sector.
Other full EES			
DK	Enervision Denmark	Optimisation of the lighting system - LED	Renewing the lighting of business parks and other large building complexes involving the owner, the administrator, the companies rented in and a LED lamp / luminaire company to overcome split incentive problems.
DK	Lokalenergi Denmark	Strategic energy efficiency dialogue	Based on a detailed customer segmentation analysis, the project provides a new and innovative long term strategy platform for B2C EES offers, increases customer loyalty and improves the energy company's knowledge about the customers' needs and priorities.
IT	ESCO Italia	Integrated EES based on a building management and automation software	Based on a building management and automation software, the EES offered includes auditing, identification of EEI actions, EEI action implementation as well as monitoring of energy consumption and energy savings.

Country	EES provider	EES	Main story
Other full EES			
IT	ESCO Provinciale Toscana Spa	Efficient public lighting systems	Installation and operation of energy-efficient public lighting systems for a bundle of municipalities.
SK	ZSE EoN	Energy certification	The service offer to customers an energy certification of the customer's building in the framework of the national implementation of the European Energy Performance of Building Directive.
SK	ZSE EoN	Thermo-vision	The service offers to customers infra-red photography of the customer's building, technology, or other complex energy system.
EES in white certificate schemes			
FR	EDF	Suivi Conso (Follow your consumption)	Check your meter every month, get energy efficiency advices, and avoid a bad surprise when you pay the end of year adjustment invoice.
FR	EDF	Energy Management Audit and Consulting	Combination of a technical energy audit and an energy management evaluation following the new standard ISO 50001 on Energy Management Systems.
FR	Exelcia	Certeco service type 1 (known EE actions)	Identification of Energy Efficiency actions that can be certified as White Certificates in the portfolio of actions realised by the customer, permitting an outside funding for future EE actions.
IT	Energynet Srl	Certification of avoided greenhouse gas emissions due to EEI actions	Certification of avoided greenhouse gas emissions accompanies the implementation of EEI actions.
Heat & cold delivery service models			
BG	Dalkia - Bulgaria	Full EES related to renovation of condominium buildings	Full EES – information to residents, energy audit, support for the application for public subsidies, implementation of measures, monitoring and optimization.
BG	Erato Holding	EES based on fuel switching in the public sector	The EES covers the whole service value chain – energy audit, financing, heating system replacement, training, fuel supply, monitoring and optimization.
DE	Stadtwerke Speyer	Direct Heating Service	Heat supply contract for single- and multiple-family houses switching the classical attitude "my car, my home, my heating" of the end-user into the direction of the energy company. Includes installation of new equipment and hydraulic balance of the heating system.
Partial service connected to EES			
AT	Kelag	Energy efficiency consulting and implementation for industry ("EnergieMonitoring" - EnergyMonitoring)	KELAG provides a full-service-package of energy efficiency improvement service for all types of industrial processes.
AT	Wien Energie GmbH	Replacement of lighting systems in storage buildings and production halls	Wien Energie GmbH provides a unique comprehensive replacement service for lighting systems in storage buildings and production halls leading to higher energy efficiency and a significant increase of lighting quality.
DE	Stadtwerke Bretten GmbH	"Smartie" – smart metering for more energy transparency	Smart meter with free selectable limit value to control the monthly electricity consumption and alerting via SMS and monthly billing as starting point for possible replacement of inefficient appliances and smart home products.
DE	Stadtwerke Jena-Pößneck	Energy Check and Energy Monitoring for cross-sectional technologies	Within energy efficiency consultation the whole energy consumption of an SME is measured, analysed and monitored. On the basis of the audit, energy efficiency improvement actions are identified and developed.
DE	Stadtwerke Tübingen GmbH	Circulation pump exchange programme B2B	Installation of an energy-efficient product with payment via the customer's electricity bill over a period of four years.
DE	Stadtwerke Tübingen GmbH	Circulation pump exchange programme B2C	Installation of an energy-efficient product with payment via the customer's electricity bill over a period of four years.
DK	Enervision Denmark	Smart Meter EnergyKey	Customers receive smart meters including two-way communication that form the basis for offering a new energy management web-based system EnergyKey, which serves as the platform for offering further detailed EES activities.
EE	Elysium	Installation of ventilation-based heat recovery system - Heatcatcher	Installation of a new system, which by improving ventilation and micro-climate in people's home can save money needed to pay on heating.
IT	Cremonesi Consulenze	Free of charge PV panels installation combined with the installation of heat pumps	Combination of energy efficiency actions (i.e. heat pump installation) with actions promoting renewable energies (i.e. PV panel installation) in an integrated contracting model.
PL	Suntime	SolarPlus	Integration of energy and water efficiency measures with installation of solar collectors in order to improve the economy of solar heating.
PL	Ekolog - ZEC	LCMS – Low-Cost Heat Savings Programme	Concept of a state-funded programme that involves training of selected tenants from low-income families who shall professionally execute low-cost heat saving measures.
PL	MetalERG s.c.p.	C2B+EE (Coal2Biomass + Energy Efficiency)	Integration of heat energy efficiency measures with fuel switching from coal (or other fossil fuels) to biomass in order to reduce the investment and overall exploitation cost for the customer.
SE	Isoleringsfirmornas Förening (IF)	Energy efficiency improvements through state-of-the-art technical insulation of heating, cooling and ventilation systems	New and enhanced marketing strategies which underline the energy performance of state-of-the-art technical insulation materials and installation practices, and thus increases customer's willingness to invest in this too often neglected EEI action.
SK	ZSE Energia a.s.	Energy audit	The service offers to customers an energy audit of the customer's building in order to identify energy saving and RES measures.
SK	ZSE EoN	Heat pump - Bonus Energie, providing bonus financing	Installation of heat pump replacing wood or gas boilers.
SK	ZSE EoN	Change of circulation pumps	Replacement of inefficient circulation pumps by new high efficiency ones.

Accelerating EES market growth

There is a significant heterogeneity of the EES markets in Europe. This makes a common European policy approach to accelerate market growth for EES difficult.

Policy instruments and initiatives for fostering the EES market in the various countries also vary; most of the time policies stimulating supply of EES are rather rare. There are various policies and measures stimulating energy efficiency improvement actions, which can indirectly induce some demand for EES. However, there are only few policies that directly support EES providers.

It is a key element to revise national policies and the legislative framework hindering the implementation of EES (e.g. law for public tendering in some countries) and creating barriers towards the development of a level playing field (e.g., policies and energy efficiency programmes that do not allow energy companies to offer specific EES).

Moreover, some of the currently existing energy efficiency policies create unwanted “competition” to the commercial provision of EES (e.g. energy agency providing energy audits).

Profitability and low payback times of energy efficiency measures are the major factor increasing the demand and supply of EES. A higher level of internalisation of external costs would make energy efficiency measures more profitable and less risky; policies in this direction should be designed with long and clear terms, as the expectation of increasing future energy prices already heavily influence current investment decisions.

With smaller customers in the commercial and residential sector, transaction costs of EES are comparatively high. A systematic way for ensuring the implementation and financing of EEI actions in these sectors is the introduction of energy efficiency obligation (e.g. for energy supply) and/or energy saving certificates (such as white certificates). This indirectly supports

the provision of EES. Assurance of effective monitoring, verification and energy savings calculation method minimising the free rider problem is also crucial for the success of these obligation schemes.

In general, these mechanisms, in form of obligation or as an energy efficiency funds, should be introduced in every Member State.

The public sector is an important agent to enhance the introduction and application of EES. In many countries there are still significant legislative and institutional barriers hindering implementation of the EES in the public sector.

These barriers should be mitigated by designing proper European policies, which should require Member States to ease and foster EES in the public sector. Specific market facilitators can help to prepare tenders, to select bidders, to conclude contracts with EES providers, and to monitor implementation.

In addition, in the long-term, the EU may be preparing harmonised procurement rules, which would make the legislation of the Member States friendlier towards EES application.

For ensuring good quality implementation of EES in the public sector, compulsory requirements for EPC contracts, model examples for EPC, EPC procedures for guarantee are important.

To generally increase trust among market actors and thus demand for EES, it would help to give clients reliable ways how to distinguish good quality EES offers and providers. Thus information dissemination and measures to define and monitor quality of EES and/or EES providers with a subsequent publishing of such information should be provided. Specific market facilitators could help to increase trust and information level.

Conclusions

In Europe there is a large potential for profitable EES, even in EES markets at initial or not well developed stage. Despite the heterogeneity of the market and the substantially different policy environment in the different European Member States, there are many chances for various market actors to provide EES or partial services related to EES, which generate profit from saving energy at the customer’s site. There is also an increasing demand for combinations of energy efficiency improvement actions with renewable energy measures (integrated EES).

The practical experience with identification, development and field-testing of new EES by ChangeBest project partners showed that there is a huge interest by different actors in entering the market and expanding the EES business (ESCOs, building technology providers, energy companies, other companies).

There are many different EES models for various customer groups and addressing different EEI areas. EES providers can learn from good practice examples, but have to take into account the respective market situation and policy framework in their country.

Strategic product development of new EES should start from the identification of possible EES ideas that provide economic, energy-efficient solutions to the customers and lead to the development of professional business cases.

Only in a few cases can profitability be expected to be extraordinary in this business. However, even small EES can be profitable if cost savings are high enough to cover costs including transaction costs (or if there are additional benefits). In general, profitability can be expected to be moderate if the EES are well designed and important success factors are respected:

- Start with thinking about the needs of the customer: Does the potential customer really need this EES? What are the benefits to the customer?

- Decide strategically: What is your competitive advantage in fulfilling the needs of the customer?
- Carefully plan, calculate, prepare and control. For the assessment of the economic viability of an EES there are specific costs items to be considered and the start up phase of an EES can be costly;
- Combine assessment of client with economic calculation of the EES;
- Carefully design the EES and the EES contract including appropriate risk management;
- Assign qualified personnel. Experienced staff is important, but even beginners or advanced learners can develop profitable EES;
- Eventually use know-how of external partners: If you cannot provide a full EES, implementation of the whole value chain can be secured via networking with other market actors and the customer (co-operation agreements);
- Draw on available insurances, guarantees, policy support and capital market instruments;
- Design information and marketing in such a way that it eases mental acceptance by customer;
- Make your organisation innovative, professional and client-oriented.

The empirical analysis has shown that success in developing profitable EES business cases strongly depends on the maturity of the market in the respective country and market segment, and on the policies and measures hindering or fostering success of EES providers. Political decision-makers on EU and national level have large responsibility in providing supporting framework conditions for EES market development and a level playing field that gives equal chances to all market actors.



Find out more online

Intelligent Energy – Europe programme

Learn more about the Intelligent Energy – Europe programme online

<http://ec.europa.eu/intelligentenergy>

ChangeBest project

Find out all the results of the ChangeBest project online

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