

# Energy research Centre of the Netherlands



**CHANGE BEST**

*Energy Efficiency Services*

*Market development*

*Energy and energy service companies*

## **Task 2.1: National Report on the Energy Efficiency Service Business in the Netherlands**



**Wuppertal Institut**  
für Klima, Umwelt, Energie  
GmbH

**Intelligent Energy**  **Europe**

**Change Best: Promoting the development of an energy efficiency service (EES) market – Good practice examples of changes in energy service business, strategies, and supportive policies and measures in the course of the implementation of Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services.**

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A main objective of the Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) is to stimulate the market for energy services and for the delivery of other energy efficiency improvement measures to final consumers. In order to achieve this objective, the ESD gives a special role to energy distributors, distribution system operators and retail energy sales companies. On the other hand, there are different types of "pure" energy service companies (ESCOs) in the market ready to expand their business in the field of energy efficiency services (EES).

Against this background, it is important to know, 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 which role energy companies developing towards sustainable ESCOs could play.

The main objectives of ChangeBest are:

- to assist energy companies and ESCOs in entering the B2B and B2C market for EES,
- to contribute to the development of the EES market as part of the implementation of the ESD,
- to demonstrate good practice in implementing the ESD.

In order to achieve the objectives specified, the project work will consist of:

- empirical analysis of the EES market and the respective economic and policy framework in the course of the implementation of the ESD,
- exchange of experiences, national workshops and a European conference,
- a large bundle of promising EES business cases and strategies implemented in "field tests",
- communication and dissemination activities, and
- induced further action and networking by energy (service) companies.

For the purpose of this paper, the following definitions have been applied:

- Energy Efficiency Service (EES): Agreed task or tasks designed to lead to an energy efficiency improvement and other agreed performance criteria. The EES shall include energy audit as well as identification, selection and implementation of actions and verification. A documented description of the

proposed or agreed framework for the actions and the follow-up procedure shall be provided. The improvement of energy efficiency shall be measured and verified over a contractually defined period of time through contractually agreed methods [prEN 15900:900].

- Partial services connected to EES: Services that just include parts (“components”) of the EES value chain like energy audits, but are designed to directly or indirectly lead to an energy efficiency improvement

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## Executive summary

Historically the supply of Energy Efficiency Services (EES) has been either a private activity, i.e. consultants assisting large energy consumers on energy (cost) savings, or a public activity of agencies, public energy distribution companies and social housing corporations assisting small(er) consumers on savings. This was embedded in an array of voluntary agreements between government and the major actors in the field of energy efficiency. There was hardly any room left for the companies specialised in delivering EES in a commercial way and the EES market is still in a take-up phase.

From all providers of some kind of energy service only 50 focus explicitly on energy efficiency, and from these only about 20 can be regarded as EESC that take financial risks, either by investing themselves or due to a result-related fee. The EESC can be divided in nine independent EESCs, two subsidiaries of energy companies and nine other, often connected to installation or building branches.

The EES activities concentrate on the built environment: particularly new buildings and dwellings, and to some extent existing dwellings. Existing buildings and production processes for SME (small and medium enterprises) are hardly focused on, except special accommodations such as swimming pools.

The EESC provide a large part of value chain activities, such as advice, actual implementation, financing, operation and maintenance and monitoring. Financing, insofar known from research, regards mixes of customer, EESC and third party financing.

Important drivers for the (future) EES market are the ambitious targets for energy savings up to 2020, the recently introduced 100% sustainable purchasing by government (including renting of very energy efficient offices), labelling of the energy performance of buildings, high energy taxes for households and small companies, and the liberalisation of gas and electricity markets.

There is no dedicated policy on stimulating the delivery of EES. Policy measures such as liberalisation of the energy markets and ambitious targets for energy savings create room for EES. Positive effects on EES can be expected from stringent efficiency demands in environmental permits, ambitious performance standards for new dwellings and buildings and agreements that incorporate the deployment of EES. Labels for buildings make savings more transparent, thereby stimulating EES related to implementation and monitoring. Subsidies, fiscal rebates or energy taxes can stimulate saving measures but not necessarily demand for EES. Subsidies on advice or audits will more directly stimulate demand for EES including for implementation. Finally, White Certificate Systems are a powerful tool for creating an EES market but a WCS has not been introduced so far in the Netherlands.

Major barriers are the insufficient level of awareness and lack of priority for taking actions, lack of information on the supply of EES, lack of “trust” in the EES product (outcome) and the absence of a legal framework for EPC, high perceived technical and business risk by the client, high transaction costs relative to the profit of energy savings, difficult access to capital (especially for independent EESCs), uncertainty about the clients financial position, and finally problems with defining the baseline for energy consumption.

Some barriers can become an opportunity for EESC. E.g. the principal/agent problem of conflicting interests of actors can be solved by an EESC as independent adviser and broker. The problem of short payback times required by customers can be solved by external financing arranged by the EESC.

Government policy on savings still relies strongly on large actors, such as housing

corporations, the building sector and branch organisations of energy users. Therefore, the EES market is dependent on the position taken by these organisations. In case they solely act as clients (e.g. municipalities) there is no competition or partnership. If actors implement saving measures, e.g. installation companies, they could be partners. But if they specialize on energy efficiency they could become competitors. If actors represent energy users (e.g. SME platform) they will be partners, unless they start their own expertise centre.

The role of energy companies in supplying EES is almost non-existent. After ending their role on energy savings in the nineties due to liberalization they opposed a new role as party with savings obligations as part of a White Certificate System. Their present role regards only the EES provision by very few subsidiaries of an energy company.

Targeting customers with a significant amount of yearly energy costs is a common strategy used among EESC. Market strategies particularly for independent EESCs often regard a focus on a niche market, such as heat/cold storage for buildings. For EES by energy companies this could be all kind of services that strengthen the relation with their customers.

From a policy perspective not all types of energy use are covered well and there is a need for EES to enhance the implementation of possible saving measures for:

- energy saving measures for older existing dwellings owned by the occupant
- energy saving measures for existing smaller buildings
- replacement of electricity using devices by efficient versions in SME
- optimal management of daily energy use in companies

An exemplary EESC, described here as good practice, shows some new insights on the potential of EES. Firstly, the provision of energy services in general, such as maintenance, creates a good starting point for offering EES because the clients trust the provider. Secondly, in some cases it is better to start communications on EES with the top management level to get commitment. But in other cases it is better to first address the operational level to assure collaboration. Thirdly, an EES provider as subsidiary of a large (international) energy or building company not only profits from better financing possibilities, but can also profit from R&D work on new technologies. The EESC described regards the deployment of new techniques on which their mother company performs R&D, as a way to strengthen existing or gain new market share and thus promote EES.

# 1 Introduction

Historically in the Netherlands, the supply of Energy Efficiency Services (EES) has been either a private activity, i.e. consultants assisting large energy consumers on energy (cost) savings, or a public activity, i.e. agencies, public distribution companies and social housing corporations assisting small(er) consumers on savings. This way of stimulating energy savings was embedded in an array of voluntary agreements between government and the following major actors in the field of energy efficiency:

- SenterNovem agency
- Energy companies
- Social Housing Corporations
- Construction and installation sector
- Organisation of municipalities
- Branche organisations of energy users

Due to the important role of these large actors hardly any room was left for the introduction of companies specialised in delivering EES in a commercial way.

After the liberalisation of the gas and electricity market, and social housing corporations put at arm's length of government, things have changed. These parties do not automatically take action in order to realise savings at their customers place, and if they take action they will not do it always by themselves. In principle these developments since the nineties created more room for an EES market. However, from 2000 on the attention for energy savings has diminished due to low energy prices, lack of government commitment and public interest. This is probably a major reason that the market for EES has not really developed. The new savings program "Clean & Efficient", with ambitious saving targets for the period 2008-2020, creates new opportunities for delivery of EES.

Given the developments described it is obvious that the EES market is still in a take-up phase. But experience with EES activities was already gained in the nineties when the energy distribution companies executed the large scale Environmental Action Plan on energy savings, renewables and reduction of CO<sub>2</sub>-emissions. Next to advice to consumers, the companies realised saving measures at the premises of the customers, often in the organizational structure of a joint-venture legal body.

The EES activities concentrated on the built environment: new dwellings and buildings, and existing dwellings. Existing buildings and production processes for SME (small and medium enterprises) were hardly focused on, except special accommodations such as swimming pools. The same holds for transportation, with some exceptions.

Policy instruments like high energy taxes and subsidies stimulated in an indirect way market based EES. However, at the same time the voluntary agreements with large actors, which often behaved as semi-public entities, restricted the market for EES.

The present program "Clean & Efficient" is again based on agreements but the position of the actors has changed, allowing EES by specialised companies. However, the main challenge is to fit EES into the fabric of agreements, responsibilities and interests of all actors.

## 2 Overview of the national EES market and its market players

### 2.1 Number and types of companies delivering EES

For this report around one hundred companies have been closely looked at regarding their activities as possible companies that provide (partial) EES. This list of companies was brought together by desk research (mainly a study of European and Dutch literature), by contacting governments (and government agencies) and by asking the companies already contacted for contact details of other companies they considered relevant for this research. Forty companies were actually contacted by phone, of which the companies that were perceived to be most interesting for the research were sent a short questionnaire. Twenty companies returned a filled-in questionnaire. Primarily the information received from these forty companies is the basis for the next overview. Companies that focus on renewable energy only have been left aside for this research.

The EES market research shows that the companies who offer energy efficiency services (i.e. who state to realise energy savings or energy efficiency) in the Netherlands are diverse. When describing the market for EES, assumptions needed to be made to classify the different EES types that came across this research. (see Table 2-1).

Three important characteristics of companies providing EES were used to define –as far as possible- EES types existing in the Netherlands.

Providers that are specified here as **ES providers** (energy service) are not considered in this research. These companies do not consider energy efficiency as a main goal and therefore are not fully focused on improving energy efficiency at their customers. Although their services are energy related, these cannot be considered energy efficiency services. Other goals, like operation, maintenance, reliability and safety of installations, are more important. In fact, ES providers do cover some part of the EES market but they are not considered to be the most important players. Since the research method applied here has a focus on the EES market, ES providers were not included in this study.

The first characteristic is whether the companies identified deliver energy efficiency as part of their core business. These companies are considered **(partial) EES providers**.

A second additional characteristic is whether a (partial) EES provider assumes any financial risk in energy efficiency projects. Financial risk comes from either investing in (or financing) energy efficiency projects, or basing rewards on the actual energy efficiency achieved for example by using performance contracts. If so, they are considered to be **EESC**.

A third additional characteristic is whether an EESC is an independent (specialist) company. This is used to classify an EESC as being an **independent EESC**. Non-independent companies are considered **subsidiary' EESC**. EES companies owned by an energy company present a special case however, and are here denoted as **energy EESC**. No distinction is being made here between public or private EESCs, for the simple reason that public EESCs were not found in this research and are assumed to represent no or a very small market share in the Netherlands.

An estimate of the number of various types of companies in the Netherlands is shown in Table 2-1.

**Table 2-1: EES supplier typology**

EES supplier type	Properties	Number in NL
ES* provider	delivers energy services	> 1000
(partial) EES** provider	delivers energy services + delivers energy efficiency as core business	+/- 50
EESC	delivers energy services delivers energy efficiency as core business + assumes financial risk*	20 (of 50)
<i>of which:</i> independent	+ is an independent (specialist) company	8 (of 20)
energy subsidiary	<i>or</i> + is an energy company or subsidiary thereof	2 (of 20)
Other EESC <sup>1</sup>	<i>or</i> + is neither independent, nor an energy company	10 (of 20)

\* ES = energy services

\* EES = energy efficiency services

\* financial risk = operating epc contracts, invests in efficiency projects, etc.

Since there is no fixed set of services and activities delivered by the companies providing EES, the classification described here should not be regarded as a black-and-white categorisation but more as an impression of the different EES types that exist in the Netherlands.

With the typology described an overview of the market for energy efficiency services in the Netherlands can now be given. The companies at one side of the spectrum of EES services and activities, the ES providers not within the scope of the research, represent a substantial market. There are probably hundreds or maybe thousands of companies that claim to provide some energy services. Taking a closer look at the range of value chain activities<sup>2</sup>, most ES providers state to deliver advisory services and services supportive to the implementation, operation and maintenance of installations and/or energy saving measures, or perform the actual implementation (installation, maintenance). The main types of ES providers in the Netherlands are private companies, some being part of a large or multinational company but the greater part being SME companies. Examples of company types are (small or larger) technical consultancy, installation, measurement & verification, and companies providing several of these services.

Gradually moving to the other side of the value chain spectrum, the market research

<sup>1</sup> "Other EES company" includes commercial firms, mainly involved in consultancy, engineering or construction, installation (& maintenance & technical facility services) to monitoring & metering and energy system supply.

<sup>2</sup> Awareness raising, information and energy advice, identification of measures, technical planning, financing and subsidies, operation/supervision, optimisation of technical operation, saving measurement and verification.

shows only few (partial) EES providers that deliver energy efficiency as their core business. The number of (partial) EES providers in the Netherlands is estimated at about 50. They are almost all private companies, varying from small to rather large companies and being independent companies or subsidiaries of (large) multinational companies. Some of these multinationals are energy companies, but most of them are companies involved in construction or engineering. Dutch energy companies are hardly involved in the EES market. Most (partial) EES providers do not notably differ from ES providers regarding their value chain activities.

The number of EESC in the Netherlands that assume some financial risk in their energy efficiency projects is limited. Taking on financial risks in energy efficiency projects comes in many forms, so from the market research it is not always clear whether companies really invest in energy efficiency projects and/or receive payments based on the energy efficiency actually achieved. Twenty companies were identified that are assumed to deliver energy efficiency as a core business and also claim to take financial risk in their projects to some degree. These EESC state to invest in projects mainly using a mix of debt and equity and/or earn rewards based on the actual energy efficiency they achieve.

Only two EESC found in the research are regarded as energy EESC, one being a subsidiary of a Dutch energy company and the other being the subsidiary of a multinational energy company. Eight EESC are identified to be independent companies. If the use of performance contracts is an additional condition to determine which EESC most closely fit the profile, then five or less are present.

The main conclusion to be drawn is that EESC, especially independent or energy companies related ones, are sparse in the Netherlands compared to several other European countries (Bertoldi, 2005 and Bertoldi, 2007). A list of the EESC identified for this research is given in Annex I.

## 2.2 Size of EES market

Presently there are about 50 companies active in the field of EES, of which probably many started service somewhere after the year 2000. There are indications that the number of companies providing EES has fluctuated throughout the years, though. A few EESC contacted stated that they terminated their EES activities for reasons, such as the higher risk of offering EES or lack of demand for EES. This points at expansion and contraction cycles in (parts of) EES market.

EESC, and more specifically the independent ones, are most active in the larger 'heat and cold storage' projects in the non-residential buildings sector (see also paragraph 3.1). These projects have only been carried out on a larger scale in more recent years. This leads to the, highly prudent, conclusion that EESC have renewed attention in the Netherlands. For this reason and stemming from the market research performed, the EES activities involving higher risk-taking probably only exists for the last several years.

The future size of the EES market is defined by the following factors:

- the economic savings potential in demand sectors in a chosen period
- the yearly rate at which this potential will be realised
- the amount of energy cost savings and investments coupled to this potential
- the potential turn-over for EES as fraction of cost savings or investments
- the fraction of saving activities actually realised with help of EES.

For the Netherlands the first three factors can be estimated at an aggregated level, based on available detailed scenario studies (see table 4.2). Given the yearly cost savings the potential turn-over of EES suppliers has been calculated by assuming that the fee is equal to x years of cost savings. The number varies per sector, as the fee will be higher for long lasting (cost) savings.

However, the most difficult and decisive factor for the market size is the last factor, the fraction of saving activities (to be) realised with help of EES. This fraction will depend on the sector, as for instance the energy-intensive industry realises energy savings without relying on external EES. It will also depend on the perceived need to save energy and the way these demands can be met. The need to save energy is dependent on energy prices and government policy. The way the demands can be met is also dependent on government policy. E.g., if energy savings are realised by suppliers offering very energy efficient devices due to stringent standards, there is less room for EES. Caps on emissions and high energy taxes could expand the market for EES.

In **Table 2-2** an exploratory calculation is made of the market potential range for EES.

**Table 2-2: Estimation of the market potential for EES in the Netherlands**

	Households	Industry	Transport	Services	Total
Energy consumption (primary, PJ)	500	750	530	480	2400
Yearly energy savings (primary, PJ)	10	12	3	8	36
Cost savings (present prices, mln E)	150	120	80	110	500
EES turn-over with fraction (mln E)	12 - 62	0 - 9	0 - 9	21 - 65	35 - 156

For SME in Industry and Services an alternative estimate of the potential number of clients was brought up during the interviews. Considering only SME with an amount of energy costs sufficient enough to benefit from EES (probably € 500.000 a year or more), around 50.000 companies (out of the 450.000 SME companies in total) could be considered potential EES customers. These probably represent roughly 60 to 80% of the total energy use of all SME in the Netherlands, though.

### 2.3 Existing incentives and barriers for EES

Major **barriers**, for all types of EESC (unless stated otherwise) are:

- Insufficient level of awareness on the need for energy savings, partly due to the stop-and-go policy on energy in the last decade.
- Lack of priority for taking actions limit the potential market for EES. For EES

customers, investments in energy efficiency generally are considered inferior to (compete with) investments needed for their core business, when investment decisions are made.

- Lack of information on the supply of EES limits the application of EES for actors that are aware of the need for energy savings and want to act.
- For energy users that probably want to make use of EES, “trust” in the EES product (outcome) is important. The absence of a specific legal framework for EPC hinders the delivery of EES. There is also a need for standardization of EES.
- There is sometimes a high perceived technical and business risk by the client, especially for commercial sectors with non-standard energy use. Particularly for SME, intervention in the energy management by a third party (EESC) is considered undesirable. For specific sectors in industry EES is restricted to areas outside the core-processes at the site of the energy user.
- Because of high transaction costs, EESC are not interested in small projects (e.g. in the residential sector or SME). Transaction costs are high relative to the small amount of energy costs and thus potential costs savings, weakening the need for energy savings.
- EESC that invest in energy savings need capital, often for a long time. Subsidiaries of large companies can rely on support by their large “mother” company. But independent EESCs need external financing and are assumed to be having more trouble in getting financing from banks.
- Since 2008 it became more difficult for independent EESCs to get access to external financing due to the financial and economical crisis.
- Lack of a rating on the financial position of the client increases the risk for EESC that a client gets broke while the investment in energy saving devices is not yet paid back. This barrier is not valid for (semi)public clients and less valid for offices that will last independent of a change in ownership.
- The definition of the baseline for energy consumption can define how the benefits of energy savings are divided between the EESC and the client. If the baseline is difficult to define, e.g. with many (uncertain) factors influencing energy consumption, this can pose a barrier for EES. In general, measurement of energy savings comes with difficulties, however this is fundamental in the delivery EES.

Some barriers can become an opportunity with the right EES offer, e.g.:

- The principal/agent problem of conflicting interests of actors (e.g. for rented dwellings and public organisations with separate financing of the building and yearly energy costs) forms a barrier for EES. However, if the EESC can involve all parties it creates an opportunity for EES.
- The short payback times required by customers (e.g. in the industry) is a barrier for EES. However, if the EESC can attract other forms of financing with a longer acceptable pay back time, this creates opportunities for EES.

The following **incentives** presently influence positively the EES markets:

- The government has set ambitious targets for energy savings up to 2020 which can only be met by applying every available policy measure and means, including the market based concept of EES.
- Recently the government has decided to go for 100% sustainable purchasing,

which implies also the renting of very energy efficient offices solely. This has a substantial effect on the overall demand for energy efficient, new and existing, offices. This could lead to retrofitting and renovation using EES.

- Labelling of the energy performance of buildings can facilitate EES in buildings because energy consumption and costs become more transparent for interested parties (future tenants or real estate investors). This could induce the demand for more energy efficient buildings. Further, energy labels provide a tool for the monitoring of energy savings realised by EESC. Labels could also possibly be a governmental means to execute policy on energy efficient buildings (e.g. required saving measures in the environmental permits). However the usability of energy labels heavily depends on whether they are (perceived) reliable.
- The energy prices are high, compared to other countries, for households and small companies due to the earlier introduction of a substantial energy tax. Saving measures have become more profitable, thus increasing the scope for EES.
- The liberalisation of gas and electricity markets has transferred the semi-public energy sector into independent and competing market oriented companies. This has created more room for supplying EES.

## 2.4 Policy mix and development of EES

When analysing the role of policy in stimulating or restricting the role of EES the following policy instrument types can be distinguished (see also overview in **Table 2-3**):

### *Regulation*

- environmental permits (e.g. WBM)

Environmental permits demand that all energy efficiency measures with a pay back time of up to 7 years are taken. In principle this could stimulate the demand for EES. However, the demand has only to be met when a permit is needed. Moreover, compliance with permit legislation is low due insufficient capacity and knowledge at the permit granting office.

- standards (buildings and appliances)

A distinction has to be made between general performance standards (e.g. dwellings) and minimum efficiency standards for specific appliances. For devices the suppliers do not need external EES in meeting the demands. Once the suppliers can provide the efficient devices, the users do not need EES either in order to save energy. On balance, strict device standards limit the EES market. For performance standards on (new) buildings an optimal choice has to be made between saving options. Here a (partial) EES provider can play a role in finding the most effective solutions. Especially in above-standard cases (partial) EES providers often have an important role. So, performance standards stimulate the demand for EES

- law on heat production and use

The new law on heat production and use regulates, amongst others, maximum tariffs for the delivery of district heat. EESC could be harmed because the regulated tariffs leave less room for a pricing policy to be used as a competitive advantage.

*Financial incentives*

- subsidies and fiscal facilities

For subsidies a distinction has to be made between subsidies on saving measures and subsidies on EES, such as audits. The subsidy on saving measures can indirectly stimulate the demand for EES as it makes energy savings more attractive. Moreover, part of the service could be the application for subsidy. Subsidies on EES directly stimulate the demand for EES, as the costs of EES decrease. However, presently no subsidies whatsoever are given, except at a small scale for demonstration projects and for private homeowners renovating their dwellings.

Fiscal facilities are provided at a substantial scale to companies and, recently again, to households (not to non-profit organizations). The indirect effect on demand for EES is not rated high, as getting the fiscal facility does not ask for special efforts in most cases. However, organizations not eligible for energy investment deduction can still benefit from this fiscal facility by shifting the investments to an EESC and sharing the profits realized.

- taxes and special tariffs

Energy taxes have been introduced at a substantial rate since 1995, with a focus on smaller energy consumers. It is general wisdom that higher energy costs stimulate the demand for saving measures and, indirectly, the demand for EES. However, because of the cumbersome provision of EES to the small consumers (see elsewhere in this report) the high taxes do not lead to an increase in the demand for EES.

*Agreements*

Agreements can be seen as an alternative for demanding energy savings by legislation, namely by social pressure. Whether an agreement leads to a need for EES depends on the type of agreement and the type of energy user. Agreements for large industry will influence EES demand not much as they generally realise energy savings without relying on external EES. Agreements with SME (small and medium enterprises) could lead to more EES demand if the problems of scale (see elsewhere) are solved. In the past the agreements incorporated some forms of EES from other actors than specialized EES providers, thus limiting the market for EES. But the present Voluntary Agreements focusing on SME and non-profit sectors leave ample room for a market for EES.

**Table 2-3 : Policy measure types and effect on EES**

	Positive	Negative	Remarks
Environmental permits	Demand extra savings > EES	none	No info on EES given and no compliance
Performance standards	EES for optimal choices needed	none	none
Minimum efficiency standards	None	No EES needed	none

Subsidies on measures	Savings more attractive > EES	none	Application for subsidy as form of EES
Subsidies on advice or audits	EES follow-up for implementation	none	none
Fiscal rebates	Savings more attractive > EES	State-of-the-art, needs no EES	Only for profit making entities
Energy taxes	Savings more attractive > EES	none	High taxes for sectors with EES potential
Agreements	More focus on savings > EES	Internal EES	none
Market based WCS	Higher value of EES	none	none
Info/awareness	More focus on savings?	No info on EES	none
Info/saving measures	EES follow-up for implementation	Part of EES not needed	none
Labels/ appliances	None	none	none
Labels /buildings and dwellings	EES follow-up for implementation, savings more transparent, monitoring tool for EES if reliable	Label + options, no need for EES	none
Communication on EES	Higher demand for EES	none	none

#### *Market based instruments (WCS)*

Market based instruments like White Certificate Schemes regard an actor that has the obligation to deliver energy savings at the place of the energy users. This actor can realize the savings by own actions but can also pay other actors to realize the savings, thus creating a market for EES. However, in the Netherlands no WCS is present up till now.

#### *Communication/procurement/labels*

If sticks (obligations) or carrots (e.g. subsidies) are not available there is the possibility to stimulate energy savings by information/communication. This regards different forms:

- General information on environmental problems to raise awareness.
- Focused information on standard saving measures for different energy users.
- Information on energy efficiency of goods (e.g. labels on buildings and dwellings).

- Tailored information on profitable saving options for specific users (audits).
- Communication on EES with energy users or between suppliers of EES.

The first form could stimulate demand for EES but the link between awareness of the need to act and concrete actions has proved to be very weak after thirty years of awareness raising. Moreover, awareness raising often focuses on small energy users where offering of EES meets problems of scale (see elsewhere in the report).

Information on general saving measures could compete with EES in the form of advice on where to save energy. However, EES normally encompasses more than advice.

Labeling of appliances does not interfere with EES as it regards a field where EES is difficult to apply. Labels on dwellings and buildings could stimulate the demand for EES if the labels lead to a need to improve the energetic quality of the building. But if the label system itself includes improvement options it will compete with offering EES.

Audits could be seen as a first step in offering EES; if the proposed measures from the audit are accepted, this could lead to a demand for follow-up EES.

Information to energy consumers on available EES, e.g. supplied as part of the environmental permit process, could directly stimulate the demand for EES.

The foundation of consultation/information exchange platforms for the different segments in the EES market could be a very cost effective way for stimulating the market.

General information and communication on energy saving possibilities plays a minor role in the demand for EES. It could even compete with EES as it is a form of advice, or hamper EES when information is (perceived) bad. On the other hand information on available EES at the right time and place could stimulate the market for EES, as well as communication between (partial) EES providers.

## 2.5 (Potential) competitors and (potential) partners in the EES market

As described in the previous paragraphs a number of major actors have been active in the field of energy efficiency in the Netherlands. These and some other actors can be seen as potential competitors or potential partners as follows (see also overview in **Table 2-4**).

The **SenterNovem** agency has been set up to implement energy efficiency policy by management of R&D programs, organising Voluntary Agreements for sectors or branches, execution of subsidy schemes, running information centres, disseminate good practice examples, measurement and monitoring protocols, etc. Some of these activities focus on end-users directly, but at a general level, e.g. information on saving options and subsidies. Most activities focus on the level between end-users and policy, e.g. setting up agreements with branch organisations. In general there is no overlap in the activities between SN and (partial) EES providers. Instead, they could complement each other, e.g. if SN informs energy consumers about (partial) EES providers, implements protocols for EES, or incorporates EES in R&D programs and pilot projects.

For energy companies a distinction must be made between production, network and retail companies. Presently the **production companies** focus on large scale production where (partial) EES providers do not play a role. The same holds for the **network companies** which do not focus on energy savings at their users. However, if

these companies would get a savings target as part of a White Certificate Scheme (WCS) this situation might change. In that case network companies could rely on (partial) EES providers to realise savings. But it also possible, like in Italy, that they realise savings themselves, thus compete with (partial) EES providers. For **energy retail companies** the relation with EES is very dependent on their position in the field of energy efficiency policy. Recently gas- and electricity companies have become participant in an agreement with government on a large energy efficiency program Clean & Efficient up to 2020. When realising their promised energy savings they could collaborate with non-energy EESCs to do the job. But they can also realise energy savings by setting up a subsidiary unit dedicated to energy savings at their customer's place. These units can be seen as competitors of stand-alone EESCs but at the moment these type of activities are limited and there are no clear signals from the EES market about competition problems. For the future there is still much uncertainty about the role of energy retail companies as to EES because it is against their interest as it will decrease turnover, and because the network companies could play a major role in obligatory energy savings (WCS).

**Social Housing Corporations** also participate in the agreements on energy savings with the government. Due to their scale they are able to organise the implementation of saving measures themselves. This does not constitute competition with (partial) EES providers as these companies do not focus on individual renters of dwellings. On the contrary, housing corporations hire (partial) EES providers to realise energy savings, especially in their existing multi-family dwellings and in their new dwellings.

The **construction sector** consists of project developers, architects, investors, building companies and installers of energy using systems. These actors can influence the EES market for new dwellings and buildings, make use of (partial) EES providers or compete with them. Project developers are potential partners of (partial) EES providers as they are in the position to hire them to realise more energy savings. Some architects have specialised in energy efficient buildings and thus compete with (partial) EES providers. Investors can ask for energy efficient buildings and thus indirectly support (partial) EES providers. Building companies have knowledge on state-of-the-art saving measures for the building shell. But few of them have specialized in advanced shell options, thus creating room for EES. However, not many (partial) EES providers focus on shell measures, thereby limiting possibilities for partnership.

**Installers** represent a special group in the construction sector as they take care of the supply of heat, cold and lighting, which generally are the focus of EES. Many EESC originate from the installation sector and some installers are incorporated in EESC as subsidiaries who technically realize EES. Some (larger) installers are even the "mother" of EESC. In practice installers are subcontractor of the EESC, doing the technical realisation. Installers could also be partner of an EESC, in the role of being the existing "home" installer for the energy customer.

Table 2-4: Competition or partnership between EESCs and other parties

	Support	Partnership	Competition
<b>SenterNovem</b>	Protocols, info on EES	R&D	
<b>Energy companies</b>			
- Energy production	None	None	None
- Network companies	None	WCS obligation (potential)	WCS obligation (potential)
- Energy retail companies	Info on energy savings	EES offered to customers	EES subsidiary
<b>Housing corporations</b>	Above standard new dwellings	Multi-family renovation	None
<b>Construction</b>			
- Project developers	None	Advanced	None
- Architects	None	None	If specialized
- Investors	Strict demands	None	None
- Building companies	None	None	None
- Installation	None	Owned or subcontracted	If specialized
<b>Municipalities</b>	Permit demands	Projects, own buildings	None
<b>Branche organisations</b>	Info on trust-worthy EES	None	?

**Municipalities** or their national organisation (VNG) can play different roles as to energy efficiency. They can apply higher standards to new dwellings, opt for district heating or renewable options behind the meter. They can use the environmental permit granting to stimulate energy efficiency in companies. They can start their own savings program for municipal buildings or for public lighting. Finally, they can also start activities in local transportation. In all cases they need other actors to realise the energy savings. This will either stimulate the demand for EES or directly involve a (partial) EES provider or EESC.

**Branche organisations** represent all kind of enterprises, from butchers to chemical industry. Because of their close contact with, and understanding of these companies they could play a role in getting energy savings realised. The SME organisation representing all SME branches has set up the "MKB Energiecentrum" which advises the companies on energy savings. If they also give information on (trustworthy) EES providers it could stimulate the EES market. Support for the actual implementation of measures is done by a separate unit acting as EESC in open competition with other

companies.

Competition can be expected regarding the potential market, but the existing market for specialized EESCs has its limits with respect to competition (e.g. only a small number of large heat-and-cold storage projects exist).

## **3 Analysis of market segments and opportunities for subsidiary and independent EESCs**

### **3.1 Existing EES market offer sector by sector**

From the research no sufficient information is available to what extent EESC are active in each sector. However, some remarks can be made on the activities, fields of application and/or techniques EESC employed in different sectors.

In the Netherlands EESC are mainly active in the development of energy efficient non-residential buildings, mostly by participating in new building projects. The main technique used in projects of EESC regard large heat and cold storage systems. However, also energy efficient buildings are developed by focusing on an energy efficient architectural design and installations. See also paragraph 3.5 on techniques applied by EESC. In case EESC focus on the residential sector, their work regards multi-family dwellings.

The involvement in non-residential buildings means that EESC have customers in several sectors. Among others these are the public sector, health care sector (hospitals, etc.), commercial services (offices), and in some cases also small to medium sized companies in industrial sectors. Particularly commercial services and the public sector (specifically central government buildings) seem to be the largest customer groups of EESC. Presently also some specialized EESC in the Netherlands focus on swimming pools, where examples of energy performance contracts with a duration of three years exist.

In the industry EESC hardly focus on the core production process but on the supporting utilities, such as compressed air systems or installations in buildings or offices.

Only one of the EESC specifically mentioned to deliver EES to the transport sector, focusing on clean transport.

It is unclear to which extent municipalities presently are customers for EESC. However this sector represents a potential market as discussed in paragraph 3.2.

Regarding single- and multi-family dwellings, available EES are hardly perceived attractive to the owners and cost-effective for (partial) EES providers. This is the case despite enough energy savings potential, partly having a reasonable payback time. Some examples of EES for private homeowners do exist, where energy saving measures are financed by the homeowner and earned back via a lower energy bill. This financing concerns mortgages or personal loans, in combination with available subsidies. The companies providing these EES services can in fact facilitate the homeowner from advice on measures to be taken, to the financing and actual installation.

Several EESC state to set minimum requirements regarding the amount of energy costs of their customers, as a sales strategy to get projects with enough revenue potential. Requirements of minimum yearly energy costs of 0.2 to 0.5 million euros have been mentioned by EESC contacted.

### 3.2 Analysis of potential needs for EES in the different demand sectors

A large potential market for EES are **new (non-residential) buildings** or commercial real estate. The development of new non-residential buildings was already mentioned as an important existing EES market. But still many projects are realised without intervention of EESC, for reasons related to the barriers mentioned in paragraph 2.3. Some examples regard ‘total cost of ownership’ projects where EESC take care of a cost effective delivery and operation of a building during its lifetime. With the involvement of an EESC being responsible for the energy efficiency of the realized building for a certain contract period, there is much more focus on designing an energy efficient building in a cost effective way (i.e. with a reasonable payback time). Currently EESC participate in large scale renovation of some central government buildings. For local government like municipalities, this could become a direction to follow.

From a policy perspective not all types of energy use are covered well with regard to the implementation of possible saving measures. The “white spots” regard:

- energy saving measures for older existing dwellings owned by the occupant
- energy saving measures for existing smaller buildings
- replacement of electricity using devices by efficient versions in SME
- optimal management of daily energy use in companies

For **existing older dwellings** the problem is twofold: convincing the owner to act on savings and provide EES in a cost effective way. The small scale of energy consumption asks for very low-cost EES. In practice this boils down to a standardized inspection and advice, as part of the labelling of dwellings to be sold or rented. However, because the quality of the advice is challenged the advice does not lead to saving measures.

A way out of this dilemma could be an EES consisting of a combination of energy savings and improvement of the indoor air quality, thereby increasing the room for more costly EES. It is not known whether this promising EES has been developed already in one or few countries. The combination of savings on energy use for heating and introduction of cooling at hot days is a successful EES for buildings<sup>3</sup>. A promising EES would be a downscaled version at the level of individual dwellings.

For **existing smaller buildings** the same problems of (not) acting to save and cost-effective EES exist. On the one hand the scale of energy use is larger than for households, on the other hand there is far more variation in the energy use situation. Considerable energy saving potential exists regarding insulation measures that can still be taken, and regarding heating and cooling installations and lighting equipment.

Here there is need for EES to focus on specific sectors and branches, thus mitigating the costs of EES while maintaining the quality. An example would be specialized EES for swimming pools. From the market research follows that a potential for EES may also exist in the hotels and hospitality sector, where climate control is known to be an issue with room for optimisation.

Savings on electricity at **replacement of devices** are more difficult to realize than savings on heat because heat is closely attached to the building, for which it is easier to formulate policy measures. In some cases electricity savings can be attained via obligatory supply of efficient devices (e.g. household appliances). But for SMEs the choice of efficient electricity using devices is much more dependent on dedicated actions.

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<sup>3</sup> seasonal exchange of heat and cold with the ground water, using heat pumps (called WKO in Dutch)

A promising EES could be coupled to existing practices, e.g. the periodically refurbishment of shops, in combination with installing the most efficient lighting and devices. Up till now no examples are known of such combinations in the Netherlands or other countries. Another possibility is EES coupled to specific electricity applications. Here, examples are present for compressed air systems and alternative air-conditioning systems (see footnote above). An observed problem for all savings on electricity is the definition of the baseline, needed to calculate savings and the benefits. The baseline at company level can be influenced by all kind of (unplanned) factors. A baseline coupled to the EES effect avoids this problem but asks for detailed (costly) measurement.

**Management of daily energy** use in companies is one of the most disregarded ways of energy savings. Illustrative for the current situation are installation companies, who traditionally provide their services by installing low investment installations and keep running, or at best optimise, the installations. However this lacks a drive for energy efficiency, like the incentive energy performance contracts can provide. Contrary to the one time decision on investment in energy efficient devices, management of daily energy use asks for a continuous effort. The effect of indirect stimulation, e.g. by high taxes on energy, is limited due to the low fraction of energy in total production costs. This is also the reason why only very energy-intensive companies optimise their daily use. The recently introduced CEN standard on Energy Management Systems facilitates further spread to smaller firms but is too complicated for SME.

One of the services from EES providers, optimization/monitoring/verification, could fill the gap. But this service is high in the value chain of EES, indicating more complexity and relatively high costs for the EES provider. Probably new ICT solutions, tailored to specific situations, could provide a cost effective EES.

Apart from the white spots some other potential markets for EES exist. In other countries **public lighting** is an example of highly specialized EES (although the scale of energy consumption also helps to apply EES). In the Netherlands no examples are known of EES companies involved in energy efficient street lighting. An incentive for EES in this field of application could be a recently established taskforce carrying out Dutch policy on efficient lighting (TF lighting). A barrier may be recent EU regulation (Ecodesign directive) on efficient public lighting including street lighting, which enforces energy efficiency requirements. However, this barrier may also be an opportunity if EESC are hired by municipalities to realise the energy efficient lighting.

### 3.3 Positioning of subsidiary and independent EESCs in the different demand sectors

In chapter 2 an overview has been given of companies delivering EES. In the Netherlands these consist of (partial) EES providers, independent EESCs, EESC related to energy companies and other EESCs. Energy retail companies themselves do not provide EES in the Netherlands. Partial EES providers generally do not assume significant financial risk in their services, while the others three do.

In the nineties the energy companies themselves were highly involved in energy savings at their customer's place and providing various EES (see chapter 2). However, these activities have been abandoned when the liberalization of the electricity market started. In 2005 a proposal for a White Certificate System, with obligations for energy companies, was strongly opposed by the retail companies and later replaced by agreements as part of the Clean & Efficient program. However, there are indications that energy companies will accept a stronger role as to EES in the future.

Presently the only contribution of energy companies to the EES market are a few subsidiaries, the so-called energy-EESC. These subsidiaries can have some back-up from the energy company with respect to taking risks in relation to EES. These companies are valuable for the energy company because they broaden the relationship between energy consumer and supplier. The energy company can attract new customers by combining it with extra services, instead of competing only by means of low prices. Due to the longer term relationship for EES the income from energy sales will be more stable.

Independent EESCs have to finance investments themselves or attract external financing. In the Netherlands all independent EESCs are privately owned (thus no public EESCs).

As elaborated in paragraph 2.1, the “other EESC” type has been identified in the Netherlands. These are not independent nor being the subsidiary of an energy company. They are the subsidiary of other types of commercial firms, mainly involved in technical areas, varying from consultancy, engineering or construction, installation (& maintenance & technical facility services) to monitoring & metering and energy system supply. Although some of these “other EESC” may also perform their activities rather independently, it is assumed that they can fall back on the larger “mother” when taking investment risks.

Partial EES providers generally do not finance EES but still have the financial risk of its operations. Some are backed by a mother company and some operate independently.

Independent and energy-EESCs both encompass few companies in the Netherlands. Therefore it is difficult to conclude from the market analysis whether their different position influences the choice of EES, technical solutions, applications and sectors.

There are indications that independent EESCs target their activities more on public buildings because of lower risks and fewer financing problems. They are notably involved in larger heat and cold storage projects. EESC related to energy companies have some industrial projects, but they are few and concentrated in facility energy use. Both are not involved in small energy consumers, such as SME and households. This is more the field of the partial EES providers (and ES providers).

### 3.4 Positioning of subsidiary and independent EESCs in the value chain

As stated earlier energy (retail) companies themselves do not provide EES in the Netherlands, these are delivered by EESC and partial EES providers.

The positioning in the value chain is closely connected to the typology (see section 2.1 and section 3.3). Differences between the value chain for these companies are:

- EESC identify measures, execute technical planning, take care of financing and subsidies, and are responsible for the implementation, operation and supervision (see **Table 3-1**).
- Various companies of these categories go on after the implementation of measures with optimisation of the technical operation, measurement of energy savings and verification.
- Some (small) independent EESCs focus on non-technical aspects of energy consumption, which includes awareness raising and information on energy saving behaviour.
- Many of the EESCs also provide energy services, such as the procurement of

power and energy, and take care of proper maintenance. For EESC as subsidiary of energy companies the procurement of power and energy will be arranged by the energy company itself.

**Table 3-1: EES value chain for different suppliers of EES**

	Partial EES providers	EESC-energy company	Independent EESC	Other EESC
Awareness raising	Sometimes	Labels, EPA	No	No
Information and advice	Sometimes	Yes	No	No
Identification of measures	Yes	Yes, audits	Yes	Yes
Technical planning	Yes	Yes	Yes (subcontractor)	Yes
Financing & subsidies	No	Yes	Yes, TPF	Yes
Implementation / operation	Yes	Yes, outsourcing	Long term EPC	Yes
Optimization	Sometimes	Yes, central facilities	Yes	Yes
Measurement & verification	No	Yes	Yes, metering experts	Yes

- Partial EES providers support their clients on energy savings without actively running financial risks. Therefore, their value chain scope is different than the previously described companies. They show large differences as to types of services delivered. As to specific EES types, providers can be competitors of EESC. However, as described in paragraph 2.1 EESC focus on specific sectors (see also paragraph 3.5) where their willingness to take on financial risks means a great competitive advantage.

### 3.5 Main EES types provided, fields of application and technologies

The EES types provided have already been identified in section 3.4 when positioning the different types of companies providing EES.

Here the fields of application and technologies are described. The information on techniques is based on the twenty questionnaires retrieved, which only concern EESC. The technologies mentioned also apply to EES providers which are not EESC, although these smaller scale companies (such as installation or metering companies) automatically focus more on smaller scale techniques (such as installations or insulation measures in buildings).

A detailed sector-by-sector analysis proved to be very difficult with the limited information available. At the end of this section some examples per sector are provided.

EESC in the Netherlands seem to be mainly involved in middle and large non-residential new building projects. Most EESC mentioned indicate that they focus on renewable energy options. In practice however, most of them provide (design, built, finance) or service (operate, maintain) a combination of renewable and energy efficient techniques like **heat pumps, CHP, (large) heat and cold storage** and even **geothermal** installations. But conventional **heating and cooling systems** and electricity using products in buildings are also part of EES that focus on energy efficiency. Therefore, most available energy systems are addressed.

To a lesser extent, measures and techniques regarding **insulation**, energy efficient **lighting** and electricity saving techniques (e.g. **domotica**) are provided.

The two EESC as subsidiary of energy companies do not differ in the fields of application and techniques they address. EESC thus address various fields of application and techniques.

According to government agencies and market parties contacted, independent EESCs are notably involved in larger heat and cold storage projects. These project ultimately serve clients originating from various sectors (e.g. commercial sector, industry, public sector), which makes it not feasible to indicate the degree to which this field of application is common practice in the different demand sectors.

Examples of technologies per sub sector:

- Government offices: advanced energy efficient techniques like heat pumps, CHP and heat and cold storage, sometimes energy efficient lighting or renewable energy options
- Care/hospitals: CHP, heat and cold storage and daily management (not renewable energy supply).
- Municipalities/swimming pools: CHP or renewable energy options
- Commercial/offices: advanced energy efficient techniques, sometimes energy efficient lighting or renewable energy options
- Households/multi-family: insulation, energy efficiency of small installations, renewable energy (solar heating systems, solar panels, heat pumps).

### 3.6 Energy Efficiency Service financing

Subsidies and tax deductions can be seen as a financing instrument, because they lower the net investment needed. However, in practice this amounts to a small part of the investments. Here financing regards (alternative) ways to make the total investment available.

Financing energy efficient techniques or measures receives increasing attention in the Netherlands, particularly for the built environment. This is mainly due to the increased focus in the Clean & Efficient policy program on providing finance options in order to stimulate energy efficiency and renewable energy in dwellings and buildings. For the demand side, e.g. collective and individual homeowners, financing by soft loans became available from the private banking sector for energy saving measures. Project developers, municipalities and housing corporations also have financing options available to realise more energy efficient buildings. Financing however remains a large barrier, as already mentioned in paragraph 2.3.

Financing of energy efficiency projects can be done either by the EES company itself or by the energy customer, and either using internal funds (shareholders' equity or other) or by issuing debt (third party financing). In the Netherlands, most EES companies questioned indicate that all financing combinations are applied. Whether the investments are made by the EESC or the energy customer depends on whatever financing construction suits best the demands of the energy customer. A majority of the EESC state to offer financing and use a mix of debt and equity financing. Whether EESC typically use a larger share of debt, larger share of equity, or equal shares, is unclear. Some companies use internal funds only (probably as long as possible), while other companies state that debt represents the larger share of the total amount of financing used.

Regarding contracting, generally two types of EES contracts are found in the Netherlands:

- outsourcing (or supply) contracts
- energy performance contracts.

With an outsourcing (or exploitation/lease) contract the energy efficient systems are owned (or taken over from the customer) and financed by the EESC. After conversion they deliver useful energy (e.g. heat and cooling instead of electricity and gas) to the customer. Such contracts usually are longer term, for example 10 to 15 years but also 30 years is possible. In some cases the ownership of the installation goes to the energy customer after the contract period. The EESC charges fixed tariffs for the product(s) delivered. Efficiency gains, from optimising the installation, and possibly price gains (in case the EESC also does energy procurement) affect the delivery costs. The cost reductions are to the full benefit of the EESC. But if tariffs are coupled to efficiency gains, clients also benefit from cost reductions.

With a performance contract the installation is owned by the customer, but the EESC is given the authority to optimise the installation or invest in more radical efficiency measures if necessary. Now, the energy efficiency gains more directly benefit the energy customer since the amount of energy costs saved are shared between the EESC and the energy customer. This happens according to the contractual agreement, in practice the energy savings are usually split (fifty/fifty). Sharing of energy savings further depends on whether the EESC has guaranteed the energy customer up front an (usually achievable) amount of energy savings, as some EESCs state to do, and/or on performance indicators the EESC and its customer have agreed on (for example the technical performance of the installation). Additional investments needed have to be earned back with the energy costs saved. The allocation of cost savings therefore also depends on the amount of investment the EESC and energy customer have made (investments can be made by one party or by both).

The use of energy performance contracts is not common practice in the Netherlands. The market research found that EPC, from the perspective of EESCs, comes with several problems. One problem concerns the guaranteed performance that should be provided by EESCs. This demands reliable monitoring of energy savings achieved, for which comprehensive and therefore costly and time consuming measurement protocols need to be set up. Further, changing behaviour of the energy customer and price increases above inflation (for which indexation is applied!) make it more difficult for the EESC to provide guaranteed savings accepted by the energy customer.

Another problem that emerged from the market research are the risks that EESCs are running associated with accounts receivables. Since the payments to be received from EES customers have the risk of default, a special 'guarantee fund' raised by the government could be a way to reduce this risk. EESCs willing to take financial risk by financing energy efficient problems can tackle some of the barriers mentioned.

### 3.7 Most commonly adopted and promising marketing strategies in the EES market sectors considered

The market research for the Netherlands did not provide enough information on market strategies as to enable sound statements. However, from the actual activities it appears that independent EESCs often focus on a niche market, such as heat/cold storage for buildings. For energy-EESC it became clear that the focus was on all kind of services that could strengthen the relation with the customers of the energy company.

As to promising strategies, EESCs address various fields of application and techniques but there seem to be a market left regarding more demand side techniques such as insulation measures and electricity using products.

One of the energy-EESCs explained they have the competitive advantage of owning some private energy distribution networks in the built environment, serving as infrastructure for a heat pump installation. Energy distribution (or network management) is considered rare, but may be a new potential field of application.

### 3.8 Summary on existing EES market offer

In **Table 3-2** a summary is given of the existing EES market offer. The overview is primarily based on the twenty EESCs that provided information on their activities, including a small number of independent EESCs. The overview does not regard public EESCs (non-existent) and energy companies (they do not provide EES).

Although the available information on the existing EES market offer was restricted, this overview is expected to reflect the overall EES market situation. The information given per sector also holds for partial EES providers, except for the offering of financing services. This insight was drawn from a comparison with the information from literature study and interviews held by telephone.

For all sectors mentioned in the table, but to a less extent in the industry sector, there are private EES providers and EESC serving these market sectors. They provide information and energy advice, the identification of measures, technical planning, and support on financing (including arranging subsidies), the implementation and management (operation and maintenance) of installations or saving measures, the optimisation of technical operation, saving measurement and verification. Support on financing, optimisation of technical operation and M&V determine to a large extent whether a company can be considered an partial EES provider or an EESC.

The table includes information on the type of EESC, either independent or a subsidiary of energy companies or non-energy companies. Since energy companies themselves are up till now not involved in the Dutch EES market, a separate table is not given.

Table 3-2: Existing EES market

	Sectors	EES market status	Type of EESC	Positioning in EES product value chain (*)	EES Financing	Specific incentives, barriers (*)	Existing Policy mix (*)
Institutional Sector	Primary and secondary schools, Universities	not well developed	all.	2,3,4,5,6,7 mostly provided	Mix of debt & equity, out-sourcing (rarely performance contracts)	B3, B10, B1 and B2 I1 and I2	P2, P7
	Local (municipalities, provinces, regions) and central government	not well developed for local-, emerging in central government (buildings)	idem	idem	idem	B3, B5, B10 I1 and I2	P7
	Public sector other Health/Hospitals Public housing	Emerging	idem	idem	idem	B3, B11, B6 I2 and I3	P7, P4
Private sector	Commercial sector: Hotels/hospitals Office, commercial Retail	not well developed	Idem	idem	idem	B4, B10, B11, also B1 and B2 I3 and i4	P1, P2, P4
	Industry	not well developed	subsidiary	idem	idem	B5, B9 and B12, also B1 and B2 I4 and i5	P4 and P5
	Residential	Emerging	Other ?	idem	idem	B6,B11,B1,B2 I1 and I3	P4, P5, P6, P9
	Other (transport)	not well developed	none	none	none	none	none

(\*) Codes for EES product value chain stages, barriers, incentives and policy measures

**EES product value chain stages:**

- 1- awareness raising,
- 2- information and energy advice,
- 3- identification of measures,
- 4- technical planning,
- 5- financing and subsidies,
- 6- implementation (operation, supervision),
- 7- optimisation of technical operation,
- 8) saving measurement and verification.

**Major barriers:**

- B1 Insufficient level of awareness
- B2 Lack of priority for taking action
- B3 Lack of information on the supply of EES
- B4 Lack of “trust” in the EES product
- B5 High technical and business risk perceived by client
- B6 High transaction costs
- B7 Trouble for independent EESC’s getting financing from banks
- B8 Less access to external financing due to the crisis
- B9 Lack of a rating on the financial position of EES clients
- B10 Baseline difficult to define
- B11 Principal/agent problem of conflicting interests of actors
- B12 Short payback times required by customers

**Incentives for the EES market:**

- I1 Ambitious targets for energy savings up to 2020
- I2 Government purchasing 100% sustainable
- I3 Labelling of the energy performance of buildings
- I4 High energy prices
- I5 Liberalisation leading to market oriented companies

**Policy mix:**

- P1 Regulation-environmental permits
- P2 Standards
- P3 Law on heat supply (new)
- P4 Financial incentives-subsidies

P5 Financial incentives-fiscal facilities

P6 Taxes and special tariffs

P7 Agreements

P8 Market based instruments (WCS, new)

P9 Communication/procurement/labels

P10 Sustainable purchasing

### 3.9 Summary of potential needs for EES in the different demand sectors

See for background information to **Table 3-3** the sections 3.2 to 3.5 and 3.7. Tables 3.3 and 3.4 have been combined as energy companies in the Netherlands do not provide EES. The results regard all types of EESCs.

**Table 3-3: Potential EES market**

	Sectors	EES service	Position EES value chain	EES Financing	Incentives and barriers	Policy mix
<b>Institutional Sector</b>	Primary and secondary schools		1 - 8	Mix of debt & equity, outsourcing contracts (rarely EPC)	B3, B6, B11 I1 and I2	P2, P8, P10
	Universities	New buildings	1 - 8	idem	B3, B10 I1 and I2	P8, P10
	Local administrations (municipalities, provinces, regions)	Buildings and public lighting.	1 - 8	idem	B3, B5, B10 I1 and I2	P10
	Health/Hospitals	Indoor climate and energy management		Idem	B3, B10, B11 I2 and I3	P1, P8, P10
	Public housing	Existing and new dwellings	1 - 8	idem	B3, B6, B11 I2 and I3	P2, P3, P8
<b>Private sector</b>	Hotels/hospitality	Climate control	1 - 8	idem	B4, B10 I3 and i4	P1, P2, P8
	Office, commercial	New and renovated buildings	1 - 8	Idem	B4, B11 I3 and i4	P1, P2, P8

	Retail	Refurbishment of shops	1 - 8	Idem	B4, B5, B6, B10, B11 I3 and i4	P1, P2, P4, P8
	Industry	Energy management.	1 - 8	idem	B5, B9, B12 I4 and i5	P4, P5, P6
	Residential	Savings and better indoor air quality, existing dwellings	1 - 8 (particularly 1,2,3 with EPA)	idem	B3, B6, B11 I1 and I3	P2, P3, P8
	Other	None		Idem		

## 4 EES product and business strategy good practice example

### *Introduction*

The EESC<sup>4</sup> discussed here as good practice example is active in the field of energy supply (e.g. energy conversion), energy management and energy efficiency. One reason for choosing this company is its activity over a very long time (since the sixties active in industry). It is a Dutch subsidiary of a large multinational utility company in water, waste, energy and transport, employing about 300 people in the Netherlands.

The company delivers long term management and replacement of energy installations, accompanied by energy efficiency services. Most value chain activities identified for this research are delivered, from diagnose to implementing and managing of techniques. However, they are less involved in advisory and feasibility studies. The sectors mainly served are industry and the built environment, on which they have tailored their organizational structure by having a separate business unit serving each sector. Below in the description of characteristics of the company, a distinction is made between both sectors.

### *Current EES delivered*

In the building sector all types of installations are serviced, including occasionally heat distribution networks. Also lighting and insulation measures are deployed. In the industry sector they deliver process steam and compressed air, for example in the food industry. Also CHP installations are operated (provision of energy conversion, primary energy carriers are bought and heat and power is delivered). They confirm that risks are larger in industry projects than in built environment projects.

### *Strategy*

In industry the strategy followed is “bottom-up”. At the installation of new energy systems the operational manager (production or maintenance manager) is made aware of potential energy cost savings. In a later stage the higher management is also involved to achieve cooperation with the customer.

In the built environment the strategy works the other way around. First contacts are made with the top management of the company. In the later stage of implementing saving measures the lower management levels are incorporated.

One reason to broaden the scope from industry to buildings is that they experience continuity in the built environment. There will be a need for energy services, even when occupants of the building change or the building is temporarily unoccupied.

### *Contracts and financing*

Some characteristics:

- Typical contracts for the company are long term, which differ from the short term contracts installers usually work with. In the built environment contracts on average have a duration of three to ten years. In industry contracts can last ten to thirty years.
- All kinds of financial and legal arrangements are used depending on the situation and demands of a customer. Contracts on average are very detailed.
- The contracts used can be viewed as outsourcing (or supply) contracts, as

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<sup>4</sup> For confidentiality reasons the name of the EES company has not been mentioned.

described in paragraph 3.6. A usually fixed price per unit delivered is set, based on energy prices and efficiency of energy conversion. Installations are managed and sometimes owned. This price and the fee the company receives are valid for the minimum performance that is guaranteed in the contract. In case performance is better, the extra benefits are shared with the customer. Separate agreements can be made on energy savings. An efficiency increase rate over time can be also incorporated in the contract.

- Because of the long duration of contracts a significant risk involves the chance that a customer stops its operations. To manage this risk the company always researches the financial position of the customer.
- Financing is done by the customer, by the EESC or by the bank (third party financing). Most projects are financed by the EESC itself, either issuing debt or using equity. These are acquired from internal funds or from the mother company. In the latter case however the company has to compete with the financing needs of other subsidiaries. In some cases the customer finances a project. Who finances in which way depends on the situation and wishes of the customer.
- The company states that they do not encounter much difficulty with acquiring financing from banks.

*Existing barriers and incentives:*

- The availability of qualified personnel is stated to be a serious barrier for growth.
- In paragraph 2.3 is mentioned the barrier that industry considers intervention in the core-processes at their site undesirable. However, the company states that according to their experience this barrier is not at hand.
- They state not to have problems regarding enough demand for their services, even without special marketing efforts, but mainly due to their historical 'track record'. Acquisition efforts in industry are usually a follow-up of services already being delivered to a customer. The starting point of most sales talks with new clients regards opportunities for energy efficiency. This could also be the other way around, if they already provide the energy supply and management for a customer and bring up energy efficiency possibilities.
- The economic crisis has not been a major barrier for the company, probably because of the long term contracts they work with. On the contrary, they state that customers actually are more likely to invest in energy savings to reap short term benefits, since the crisis has decreased incentives to make investments with longer term benefits like capacity building.

*Barriers and incentives from policy:*

- Overall, they indicate that current policy and regulations do not impose such a large effect on the EES they provide.
- The voluntary agreements (MJAs) and the introduction of the emission trading scheme are said to be a reason why customers contact the company. Besides energy savings, more attention is now also been given to renewable energy because this is part of the voluntary agreements of industry with government (MJA3). They see the introduction of bio-energy as an important new service. For some clients a sustainable image plays also a role in taking action.
- Existing stimulating policies such as the fiscal instrument 'energy investment deduction (EIA)' are used. Green financing (soft loans) has not been used yet, but could become an option for the company.
- Environmental permits are not viewed as having a direct stimulating effect on the demand for EES. However, when these permits would be enforced more strictly this effect could be present.
- A guarantee fund providing financing for customers that have become bankrupt would provide the company with more financial certainty.
- A barrier faced is the tariff regulation for delivering heat by means of a heat

distribution networks ('No-More-Than-Alternative' principle, based on gas boilers). They do not want to deliver services according to the prices set by this regulation, since they expect to be able to deliver these services for a lower price. Probably they foresee struggles with customers questioning the regulated tariff.

- The company is not yet convinced of the positive cost/benefit ratio for smart meters.

*Potential markets:*

- In general the company sees a large potential market for EES, especially in the industry sector, but also in the health care sector. New services constitute energy management.
- Contrary to most EESCs, the company considers SME companies also as a potential market. However, the SMEs should be part of a chain company or franchise chain.
- The deployment of new techniques, on which their mother company performs R&D, are regarded as a way to strengthen existing or gain new market share on EES. Techniques to be introduced could be ORC or biogas. It is stated that they want to do more with renewable energy in general. They say to not have worked out a specific market or technique they want to target, though.

*Other relevant aspects:*

- The company experiences competition from energy companies when dealing with municipalities because these companies had historic ties with municipalities. This is also different from most other companies in this research.
- Some potential clients have difficulty in accepting the management fee the company presents for its services, because clients only look at visible costs and not the (very high) costs of interruptions in energy supply the EESC has to prevent or has to overcome.

*Choice of good practice example*

The reasons for choosing the EESC described as good practice example are:

- Its activity over a very long time, which proves the soundness of the concept
- The activities in industry, which is often regarded as a difficult sector for EES
- The synergy with the supply of energy services, such as maintenance
- The large array of financing methods possible
- The role in introducing new technologies as part of EES.

The properties of the good practice EESC are shown in **Table 4-1**.

**Table 4-1: Summary information about the best practice examples described**

	<b>Good practice example</b>
EES provider	Anonymous
Sector(s) addressed	Built environment and Industry
Technology/field of application	Industry: Energy conversion (operating CHP installations and delivering process steam), energy management

	Built environment: Installations, lighting, insulation measures
EES value chain stages considered	<ol style="list-style-type: none"> <li>1. Awareness raising</li> <li>3. Identification of measures</li> <li>4. Technical planning</li> <li>5. Financing and subsidies</li> <li>6. Operation /supervision</li> <li>7. Optimisation of technical operation</li> <li>8. Saving measurement and verification.</li> </ol>
EES financing typology	Financing mostly by the EES company itself (debt or equity, internal or from mother company), sometimes by customer
EES Contract type	Outsourcing (supply) contracts
Existing policy instrument(s) relevant for EES	Price regulation heat distribution networks (negative) Fiscal support (positive)
New policy instruments	Government guarantee fund for customers
Barriers for EES	Qualified personnel on EES

## ANNEX I: List of EESC identified for the Netherlands

### **EESC (independent, subsidiary of energy/other companies)**

Amvest energy

BAM Techniek - Energy Systems

CLD

Cofely / GTI Energy Solutions / GTI Energy & Infra BV

Dalkia

Dubotechniek Energie

EnerDeCo

EnerQuest

Essent Energie Exploitatie

GSH EnergyPlus

Honeywell

Hydreco

Imtech

Instead

Johnson Controls

Kem

Newnrg

Siemens

Sprinx

Vaanster

VW Dec

Wolters & Dros

ZON Energie BV

## 5 References: Interviews carried out and further sources used

### List of the persons interviewed

<b>Name</b>	<b>Company/Institute of origin</b>	<b>Position in the company/Institute</b>	<b>e-mail</b>
van Trijp	MKB-Energiecentrum	Senior Projectmanager	j.van.trijp@energiecentrum.nl
Kempen	ESSENT Energiediensten	Manager Project development	Ger.kempen@essentenergiediensten.nl
Kouwenhoven	COFELY	Business Unit manager	Bjorn.kouwenhoven@cofely.gdfsuez.nl
Hulshoff	SenterNovem	Program manager	a.hulshoff@senternovem.nl
Stokman	Dalkia	Manager Industry	stokman.r@dalkia.nl

**Further sources used:**

## Literature

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## Other

Information from twenty short questionnaires with EES- and company specific-related questions, sent out and received September-October 2009.

Websites of more than hundred presumable companies providing EES, August-November 2009.