

# **Does "Energy Service" Always Mean "Energy Efficiency"? - A Customer Dilemma in Swedish Perspective**

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## **ABSTRACT**

The energy utilities and energy service companies (ESCOs), operating on the deregulated electricity market in Sweden, offer today a great number of energy services to the customers. Before the 1996 deregulation, there were different kinds of DSM-measures focused on energy efficiency and diminishing load demand. These measures have almost disappeared in the first stages of the deregulation. Today, new types of energy services are being developed at the utilities and energy service companies, in some extent as means of competition.

Can the customer make an a priori assumption that the energy services always are energy efficient? What criteria should be applied by the customer to make a sufficient judgement?

This paper presents the results of our investigations on to what extent today's energy services can guarantee an efficient energy use and reduce load demand to consumers. A synthesis of different types of energy services on deregulated electricity markets in Sweden constitutes the base for the choice of suitable cases. The criteria that the customers can use when choosing energy services are suggested, evaluated and discussed.

The results from this investigation should be of interest for customers when choosing and evaluating the available energy services, for electric utilities and ESCOs when developing new energy services, and for decision-makers interested in energy efficiency measures.

## **Introduction**

Before the deregulation of the electricity market in Sweden, Demand-Side Management (DSM), which originates from the market monopoly with broad possibilities for long-term planning, was used as an accepted term directly connected to energy efficiency. Different types of measures were implemented and tested at the end-users (Strid, Bergmash, 1999).

Since the deregulation of the Swedish electricity market which began in January 1996, the situation is completely different within the energy (electricity) branch. The DSM services disappeared from the market. The customers can freely choose the supplier and "demand-side" has changed its meaning for the energy utilities. In the very beginning of the deregulation process, the energy companies were interested in selling as much electricity as possible. But competition has become harder and harder and the margin of profit has diminished. To keep customers and reach new ones has become the matter of existence in the market (Matsson, 2000).

Today, a very wide spectrum of energy and value added services has been developed and used as a competitive tool in the market. It means that the energy utilities

are not only selling energy, but delivering other "products" to customers. The customers are not really interested in energy itself but in indoor climate, comfort and convenience. To sell energy and value added services to customers is the only way for the utilities to increase sales and profit.

The customers have to decide whether they want to buy a specific service but they are unable to act because of lack of knowledge and criteria when selecting an energy service from the offerings. The most significant question is whether the service is leading to implementation of energy efficiency measures and if it is beneficial for customers and/or society.

The main purpose of this paper is to suggest, evaluate and discuss the criteria that the end-user could apply when choosing energy services offered by energy service companies.

## Energy services in Sweden

There is a wide spectrum of energy services offered by the Swedish ESCOs to customers.

Table 1 shows the energy services, examples of different kind of services delivered by energy companies, and respective charges, when available.

**Table 1. Energy Services in Sweden in March 2000**

Energy Services	Examples	Charge	Energy Service Company (examples)
<b>Energy advice</b>	Phone call energy advice (private customers)	Free	Brista Kraft
	"One hour home visit" (private customers)	500 SEK (56 USD)	
	Advanced energy auditing (private customers)	depends on object	
	"Secure contract" (small enterprises)	Free	Halmstad Energy Utility
	"Going through" (companies, properties)	12.000 SEK (1333 USD)	Graninge
	Energy investigation (companies)	?	Gestrike Kraft
<b>Electric safety surveys</b>	Safety auditing	?	Boo Energy
	Children's safety	1.500 SEK (167 USD)	Sydskraft
<b>Remote monitoring</b>	"On duty"-contract	?	Nynäshamn Energihandel
	Energy service contract	?	Göteborg Energy
<b>Measurements and statistics</b>	Measurements and statistics	Depends on needs	Brista Kraft Nora Energy
<b>Plant service</b>	Contract services	?	Västbo Kraft Västerås Energy & Water
<b>Whole concept</b>	All energy from one supplier	?	Borås Energy Shell
<b>Total concept - outsourcing</b>	"Ready for use" energy	?	Vattenfall
	"Ready for use" heat	?	Vattenfall

## Energy advice

The main purpose of this kind of energy services is to lower the customer's energy and load demand, which means more optimal and efficient energy use.

The energy advice services occur in very different forms and shapes. From a very simple phone call advice for private customers, through home visits, to very comprehensive and extensive investigations and analyses for larger industrial customers.

The deregulated electricity market has resulted in energy utilities having customers dispersed geographically. To provide good services, the energy utility needs good organisation and available resources close to the customer. To be closer to customers, some energy utilities engage local consultants, others have their own experts travelling around and others turn to a regional or local grid operator.

**Energy advice for the private customers.** This service, offered for example by Brista Kraft, can be divided into three steps (Brista Kraft, 1999):

- Phone call advice, where the customer can get some simple energy conservation tips on indoor temperature, tap water, ventilation, space heating etc. Brochures and leaflets can be sent to customers' homes. This service is free of charge.
- "One hour in your home" is a visit at the customer's home for a very short energy survey. Actual statistics on energy use are prepared before the visit as a background for discussion on energy efficiency measures. The charge is 500 SEK (56 USD).
- Advanced energy auditing is based on both energy statistics and energy investigation. A proposal with possible energy measures, the costs, and expected energy savings is presented to the customer. The price depends on the size of the property.

**"Secure contract" for smaller industrial customers.** This package, offered for example by Halmstad Energy Utility, gives a customer a constant energy price and a guarantee that the energy costs will diminish, thanks to the suggested energy efficiency measures. The contract consists of the following obligations (Halmstad Energy Utility, 1999):

- Constant electricity price for the next 5 years,
- Energy efficiency analysis and recommendations on measures,
- Services through the Internet,
- Personal contact.

**"Going through" for the companies and properties.** A good example of this service is "100% energy efficiency with do-it-yourself measures", offered by Granninge, which consists of (Granninge, 1999):

- Energy auditing of the whole company/property, concerning construction of the house, HVAC-systems, control system, indoor climate etc.,
- Energy balance calculations,
- Analysis of the energy auditing and energy balance,
- Energy conservation potential,
- Investment cost marking,
- Energy cost analysis,
- Energy efficiency measures recommendations,
- Summary report on the whole investigation,
- Oral presentation of the results.

There are some different price alternatives. The utility can, for example, guarantee that the customer will save the cost of the energy efficiency measures within one year. This alternative costs 12.000 SEK (1333 USD). If the saving will be higher than that, the utility can keep 30% of the exceeding amount (but not more than 30.000 SEK - 3333 USD).

**Energy investigation for the industrial and commercial customers.** Energy investigation, offered for example by Gestrike Kraft, consists of (Gestrike Kraft, 1999):

- Interview with personnel responsible for the operation, 1-2 hours,
- Survey and auditing of the whole plant, 10-13 hours,
- Analysis of the energy use and energy conservation potential for every sub-system,
- Report containing:
  - Load shapes,
  - Possible energy conservation potential,
  - Energy efficiency measures recommendations,
  - Profitability assessment,
  - Overall environmental aspects.

### **Electrical safety surveys**

Some of the ESCOs offer this kind of service dealing with electrical safety at home or at the company.

**Safety auditing.** This service, offered for example by Boo Energy, is free of charge for new customers. The auditing takes about 20 minutes but can be more detailed if needed (Nordgren, 1999).

**Children's safety.** This service, offered by Sydkraft, is focused on children's safety, and electrical safety in particular. The safety auditing is carried out together with the customer for the purpose of locating all the eventual dangers for the children. Electrical safety (sockets, cords etc.), stairs, bathroom, kitchen, laundry-room, windows and movable objects are investigated. Directly after the auditing, the customer gets a report and recommendations. If safety should be improved, the company can offer some contacts with suitable contractors. This service costs 1.500 SEK - 167 USD (Sydkraft, 1999).

### **Remote monitoring**

These services help the customer with the monitoring, maintenance and repair work of the plant.

**"On duty" - contract.** This service, offered by Nynäshamn Energy, guarantees that the on duty-personnel, working the whole day and night, supervises all the automatic and manual alarms from the customer. All the services are integrated at the same energy service company (Nynäshamn Energo Handel, 1999).

**Energy service contract.** This package, offered for example by Göteborg Energy, contains different services that can be chosen independently (Göteborg Energy, 1999):

#### Operation:

- Direct control from the Göteborg Energy operation unit,
- Remote monitoring,
- Operational optimisation,
- Alarm handling,
- Error analysis,
- 24-hour's duty.

#### Maintenance:

- Preventive and regular maintenance on the installations.

#### Administration:

- Energy and costs statistics,
- Administration of servicing, repairing and rebuilding.

### **Measurements and statistics**

Many of the energy service companies offer measurements and statistics as services to customers, often combined with energy and load management. The statistics can comprise electricity and heat use, air, noise, electric and magnetic fields. The price depends on the extent of the service. Less detailed statistics, based on the 1-hour metering, can be offered to the private customers.

### **Plant service**

Some energy service companies, for example Västbo Kraft and Västerås Energy & Water, offer contractor services that very often are performed in co-operation with a regional or local grid operator.

These services can cover different specific parts or installations of the plant.

### **Whole concept**

This concept means that all energy supplies, like electricity, oil, gas, district heating and cooling, are delivered by the same energy utility. At the same time the utility can offer "Ready for use..." - concept (see "Ready For Use - Energy" below).

### **Total concept and outsourcing**

This service gives the customer an opportunity to sell or lease a part or the whole plant, and transfer the responsibility for the operation and maintenance, to the energy utility. One of the examples of this service is Vattenfall's concept "Ready for use..." (Vattenfall, 1999).

**"Ready For Use - Energy".** This package, offered by Vattenfall, is meant to give the customer:

- More time for the main activity,
- Secure heat supply,
- Long-term contracts,

- New solutions for the future,
- Economical prospect,
- Flexible solutions,
- Environmental protection guarantee,
- Released capital.

This concept can be applied for many different installations and appliances, for example electricity, heating and cooling, compressed air, indoor climate, district heating, bio-mass energy, industrial energy, energy management etc.

## **Energy efficiency assessment - "5 questions"-method**

The majority of energy services offered today consists of different types of energy advice, energy surveys and energy analyses. The services offered, range from free phone call advice to profound but expensive investigations.

There is a significant difference regarding the energy company's involvement and services offered to private customers and those offered to commercial and industrial customers. Services carried out at private customers result solely in a final report. There is no further commitment from the energy company. Services offered to the commercial and industrial customers can however be divided into different levels, depending on the contract signed by the energy company and the customer. The levels are:

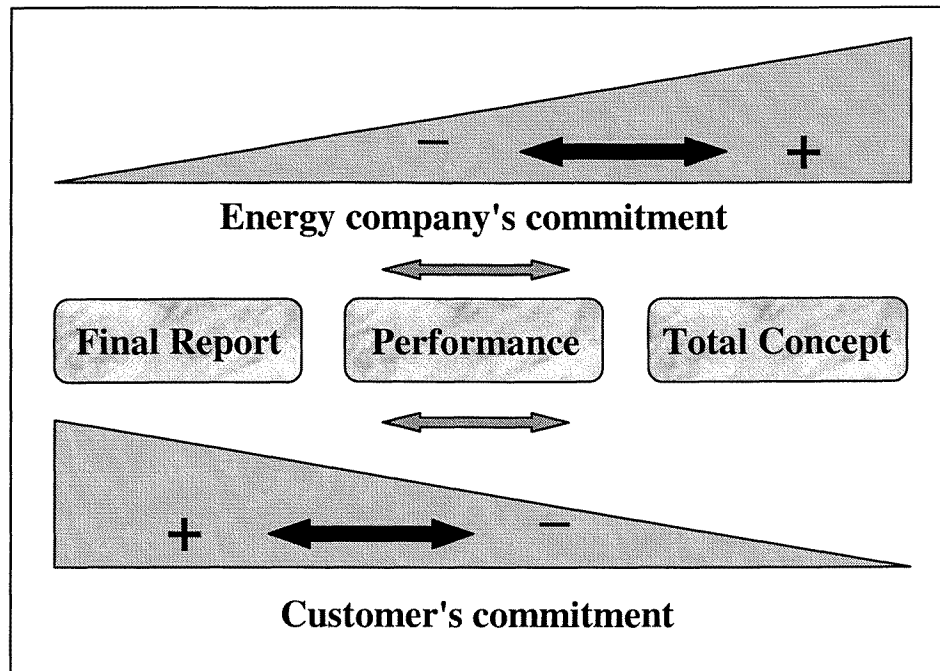
**1. "Final Report":** Advice, survey or analysis that leads to a report suggesting possible changes. After the report has been delivered to the customer, there is no further commitment. It's up to the customer to carry out the suggested energy efficiency measures.

**2. "Performance":** Final report as mentioned above is delivered and the energy company takes care of the suggested changes. The measures are carried out by the energy company or external contractors.

**3. "Total concept":** The energy company undertakes responsibility for the customer's energy supply. Daily supervision, service, maintenance and energy efficiency measures are carried out. There are of course different contracts but usually the customer's plant is bought by the energy service company. Then the customer pays a fixed annual charge and a energy charge per kWh.

Figure 1 visualises the energy company's and the customer's commitment on the three levels mentioned before. When there is a lack of commitment from the energy company, the customer is forced to complete the energy efficiency projects himself. There is a substantial risk that the customer will fail to implement the energy efficiency measures.

All the services offered to private customers are placed under the level "Final Report", which means a low commitment from the energy service company. This indicates that the private customers need to possess knowledge about energy efficiency and be very dedicated to finish the projects proposed in the "Final Report", even if they probably expected that the energy company would perform it.



**Figure 1. Energy Company's and the Customer's Commitment on the Different Levels of Energy Services**

The majority of the private customers and many smaller business customers lack the necessary knowledge to carry out the energy efficiency measures by themselves. That is actually the very reason for buying these services from the ESCOs.

What can this category of customers do to find the best services available? There are several factors that can be judged without higher technical knowledge:

**1. Price.** The price is of course a very important question. A customer always wants to get value for the money. A question that should be asked is:

**Is the price of the energy auditing independent of the results of the energy efficiency measures?**

**2. Commitment.** Because of the reasons mentioned before, the customers shouldn't be left by the ESCO before the project is carried out successfully. A question that should be asked is:

**Is the energy company involved in the process after the investigation?**

**3. Guarantee.** In the final report there is usually an estimation on the size of energy savings and load reductions. The customer has to decide whether the changes should be made or not, based on this estimation, but his knowledge usually is not enough to make a judgement. It is very important that the customer gets a guarantee that the final result of the energy efficiency measures will be close to the estimation. A question that should be asked is:

**Does the energy company give a guarantee for the energy efficiency?**

**4. Financial support.** A financial support is needed when performing energy efficiency measures. A question that should be asked is:

**Does the energy company help with financing the energy efficiency measures?**

**5. Long-term contract stipulation.** Some services are connected to long-term contracts that will keep the customer from choosing another supplier. A question that should be asked is:

**Is the contract free from restriction on a long-term engagement for the customer?**

The customer equipped with these 5 questions can in a better way evaluate the conditions connected to different types of energy efficiency services. The answers from the energy service company will be a sufficient background to make a decision when choosing energy services. The more "Yes" answers, the better energy efficiency service.

## **Energy efficiency service test**

In purpose to investigate how these very relevant questions can be answered when evaluating different energy services, offered by the energy service companies, three specific energy services have been chosen to be tested:

1. "Energy Advice" from Brista Kraft for private customers that can be carried out in three steps, as described before.
2. "Secure Contract" from Halmstad Energy offered for small enterprises, as described before.
3. "Ready for Use - Energy" from Vattenfall for both industrial and private customers, as described before.

The information about every service, collected during the project, was used as a background to answer the energy efficiency assessment's 5 questions. The results are shown in Table 2.

The first service "Energy Advice" is not restricted with a long-term contract and its price is not dependent on the result of the energy efficiency measures. On the other hand, the questions 2, 3, and 4 are answered "No", which means that the energy company does not take any responsibility for the further process and successful project. This service, paid by the customer, does not give any guarantee that the energy efficiency measures will be carried out at all.

For the "Secure Contract" service, the only question answered "Yes" is the first one, which means that the customer not only miss an energy efficiency guarantee, but even is bound with a long-term contract for up to 5 years.

The "Ready for Use..."-service gives probably the best guarantee for energy efficiency measures, answering "Yes" questions 2, 3 and 4.



**Table 2. Energy Efficiency Assessment "5 Questions" for 3 Specific Energy Services**

Criteria	"Service"/ESCO		
	"Energy Advice" Brista Kraft (private customers)	"Secure Contract" Halmstad Energy (small enterprises)	"Ready for Use - Energy" Vattenfall
1. Is the price of the energy auditing independent of the results of the energy efficiency measures?	Yes	Yes	?
2. Is the energy company involved in the process after the investigation?	No	No	Yes
3. Does the energy company give a guarantee for the energy efficiency?	No	No	Depends on contract
4. Does the energy company help with financing?	No	No	Yes
5. Is the contract free from restriction on a long- term engagement for the customer?	Yes	No (up to 5 years)	No Depending on contract

## Conclusions

The results of this investigation show that the "5 questions"-method can be applied by the customers as an evaluating tool when choosing energy services, trying to analyse and understand their contents and meaning.

ESCOs seem to be interested in energy efficiency guarantees and energy efficiency measures when they are involved and the more they can decide about customers' plants and energy use. At the same time, the engagement from the customer's side essentially declines.

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