

# **ENERGY SERVICE AGREEMENT - MODEL FOR THE FUTURE - RELIABILITY AND CREDITABILITY**

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## **1. SYNOPSIS**

This paper should be regarded as a contribution to the current Demand Side Management discussions and the development of new Business Models, such as Energy Service Agreements. It also concerns how to plan for energy for a sustainable world.

## **2. ABSTRACT**

During recent years Energy Utilities have paid considerable attention to the efficient use of energy. However the role of Energy Utilities is not a matter of course but called into question by many customers. Are Energy Utilities reliable and creditable while making a profit on selling energy and at the same time encouraging customers to use less energy more efficiently?

The aim of this paper is to discuss future models of business within the scope of Demand Side Management and the overall necessity to conserve energy and other natural resources.

Since 1992 Göteborg Energi AB has cooperated with certain customers in agreements called Energy Service Agreements. As an entirely new sort of agreement, the structure, the commitments and the responsibilities have not yet been finalized and the agreements are still being improved.

## **3. INTRODUCTION**

Sweden is supposed to be one of those countries which has carried through a very energetic policy to reduce energy consumption in existing buildings. I am not quite sure that this statement is entirely true. In any case, the potential to use energy more efficiently is still considerable and the activities during the eighties were limited to space and water heating.

## **4. RETROSPECTS OF THE EIGHTIES**

In order to make clear what I mean with the doubt that I expressed above I will refer to three different experiences.

### **4.1. "How much is enough - another Sweden?"**

At the seventh Special Session of the United Nations in 1975, two Swedish scientists presented a paper "How much is enough, another Sweden?". Their aim was to call into question whether the Swedish way of life as representative of modern industrial countries was viable in the long run. One example concerned the use of energy. Regarding the heating of space and water they proposed an immediate maximum of 300 kWh per sqm and a future level of 200 kWh per sqm. The scientists were strongly censured as a threat to the Swedish welfare.

Ten years after the presentation of the "Enough" proposal paper, the average use of energy for space and water heating in Gothenburg was less than 170 kWh per sqm. No welfare has been lost so far.

The lesson to be drawn from this experience is that the knowledge of future possibilities is limited by the capabilities of today.

#### **4.2. Multi-family houses in Gothenburg**

During 1988 a complete and careful analysis of the use of energy for space and water heating in the multi-family houses of Gothenburg was carried through. The total heated area of these buildings is about 15.000.000 sqm (the total heated area of dwellings in Gothenburg is about 23.000.000 sqm). The analysis was presented in a report showing the present use of energy and the potential to reach future lower levels. The conclusion was that there are available technologies and other circumstances which can reduce the energy demand by about 50%. Diagram 1 gives a summation for houses built 1961-1975.

#### **4.3. Buildings owned by the Local Authority of the City of Gothenburg**

There are about 2.000.000 sqm of heated area in buildings used for various activities administered by municipal institutions of the City of Gothenburg. During the eighties, energy conservation improvements were very systematically applied and equipment for continuous control was installed. The use of energy for space and water heating has been considerably reduced while the general use of electricity has slowly increased. Diagram 2 gives a summation.

### **5. THE 1994 GENERAL SITUATION**

The Swedish energy situation may be described as very complex. Considered as a network of factors, it is not a very consistent network. However the various factors are more or less connected. The main factors, in my opinion, are:

#### **5.1. National policies**

A comprehensive view of the energy future is not a hallmark of the Swedish national energy policy, which could best be described as vague and disjointed.

The interest has been focused on the question of nuclear power, discussions about possible alternative energy sources, modifications of taxes related to energy use and/or carbon dioxide emissions etc; forecasts about the global and local environment, detailed revision of regulations for the construction sector and, during the beginning of the eighties, contributions and loans to promote energy conservation improvements.

An other way to describe the national policy is that the major interest and efforts have concerned the production of energy while the rational use of energy has been a question given low priority. The production of energy involves a few and large-scaled decisions while the efficient use of energy means many small decisions; a kind of anarchy and/or tyranny of details.

#### **5.2. Energy prices**

Comparing current rates of electric energy from a customer perspective, we learn that Swedish rates are and have for a long period been much lower than in other modern industrialized countries. Per capita consumption is high.

#### **5.3. Perceptions of reality**

There are two main possible ways to view our present global and local situation regarding energy and other natural resources.

Business as usual. We continue to behave as we have done and continue using our resources as we have during the previous decades. This way is accepted as a matter of course by the majority of our political parties and creators of public opinion, and is closely related to the paradigm which contains, as an axiom, the concept of economic growth as a necessity.

Conservation of natural resources and protecting the environment. The awareness of the conditions necessary for human life and the limited flexibility of the environment has increased considerably. This awareness poses questions about living quality and social well-being. A well-known statement to this effect is the Brundtland Commission's report to the UN.

Current proposals and discussions of tax change-overs seem to herald an alteration of established ideas and ideologies. Of course the Agenda 21 statements also imply development in the same direction. And common people's awareness of environmental needs is being strengthened.

#### 5.4. Development of technologies

During the past ten or fifteen years, the development of energy efficient construction components, domestic appliances and building services, has advanced greatly. Significant examples are insulation material, windows, heat pumps, white goods and computer based equipment for control and operation of building services.

#### 5.5. Spreading know-how

The construction and real estate sectors as well as the energy sector itself are conservative and in general do not assimilate new experiences beyond their own traditional cultures as a matter of course. Thus the considerable potential for energy efficiency and the technical solutions available are not widely known and are infrequently implemented.

#### 5.6. Energy utilities

Swedish Energy Utilities are described as monopoly actors with a technical orientation. In my opinion this means not only continuously referring to a very rigid framework of technology and economy but also a company culture which is not open or susceptible to the values and knowledge of other cultures.

In the beginning of the nineties Swedish Energy Utilities seemed to pay attention to the efficient use of energy. Several conferences and seminars were arranged and common topics concerned Demand Side Management, Energy Efficiency, Bright Lighting and Control Systems. Development activities were restarted. A few years later most of the utilities seem to have returned to the traditional order.

### 6. INCENTIVES AND MISSION

The conclusion to be drawn from the above account of the present situation is that there are problems concerning the possibilities of using energy in a more rational way. Perhaps the main problem is that the incentives are not evident enough and sometimes seem to be unreliable. Consequently there are no actors in the market taking true responsibility.

The question is: who should be the coordinating "contractor"? In my opinion the Energy Utilities are the actors most suited for this task. They already have relations with all kinds of customers and they are economically strong.

Is there any mission more challenging and important than leading modern society into a future where we conserve our natural resources and protect the environment? My conviction is that the mission for a sustainable world can and should be led by the Energy Utilities, and carried out on a footing of sound business practice.

### 7. NEW BUSINESS MODELS

#### 7.1. Indoor Climate Agreements 1985-1992

During the eighties the Energy Conservation Staff of the Real Estate Board were responsible for the Energy Conservation activities in buildings owned by the Local Authority of Gothenburg. At that time experience indicated that successful energy conservation of buildings included both carrying through correct improvements in a correct way and the qualified ongoing operation of building services.

Special Indoor Climate Agreements established a double goal in order to guarantee good indoor climate and low energy costs. The services of the buildings concerned were furnished with computer based equipment for long distance control and operation.

This double goal was successfully achieved. Diagram 3 gives a summation of energy use in comparison with buildings without Indoor Climate Agreements. The conclusion was that qualified improvements of indoor climate also mean lower energy use. The 1985 Indoor Climate level refers only to one building (8700 sqm) while the 1991 level refers to 20 buildings (130.000 sqm). The most remarkable example was the City Library, see diagram 4.

## 7.2. Energy Service Agreements 1992-

During 1991-1992 the key people from the Real Estate Board dealing with Indoor Climate Agreements joined Göteborg Energi AB. Our goal was to improve the above mentioned agreements and to do so on a very business-like footing.

A new Profit Center called Rational Use of Energy was established within Göteborg Energi AB and thenew agreements were called Energy Service Agreements. The goal was to offer commercial customers complete service in areas related to energy use. The profit center is still a small group and the activities are so far successful.

The buildings concerned are owned not only by the Local Authority but include privately owned office buildings, supermarkets and department stores. These services of the buildings are computerized. This means that Göteborg Energi AB is able to carry out long-distance control and operation. The operation center is situated in our office building and has constant two-way communications. The computer equipment makes it possible to comply with the customer's requirements on a very detailed level concerning in-door temperatures, lighting, operation schedules, registration of data, etc., as well as stand-by and constant control of electricity, district heating and water supply.

## 7.3. Gothenburg Goals and Strategies

The goal of Göteborg Energi AB in relation to our commercial customers is to enhance the competitive position of these customers as concerns their use of energy.

Our strategies are as follows:

- \* low total energy costs
- \* service and accessibility
- \* a variety of energy services
- \* conservation of resources

If our strategies are successful, customers should in the future choose Göteborg Energi AB as the obvious partner.

## 7.4. Future Business Models

One of the purposes of this paper is to describe and to discuss the motives and the hallmarks of Energy Service Agreements as a model for cooperation between Energy Utilities and their customers, primarily commercial customers.

The alteration of the Energy Market from a monopoly situation to an open competition means that the Energy Utilities have to confront new conditions. The goals and strategies mentioned above are the conclusions of Göteborg Energi AB. Assistance to commercial customers under business-like conditions to help them use energy more rationally should be one of the future instruments of competition.

Future bids to customers should be two pronged, which means that we offer improved quality and lowered costs in relation to energy use. This means that we must focus on the benefits derived from the use of energy and not on the energy itself. An Energy Service Agreement should concern the indoor climate conditions and lighting required as well as the safety operations of building services etc. The agreements should also contain clauses pertaining to stand-by preparedness in case of immediate repairs as well as proposals for permanent improvements and ongoing information to the owner and his staff.

The final development of Energy Service Agreements will have, as a consequence, that invoices will concern only the benefits of energy use. This means that no details regarding the amount of kWh and kW will be shown on the future invoices.

A main question concerns whether the customers will consider the energy utilities reliable and creditable. They may find it questionable that the same utility, on one hand, makes a profit on selling energy and, on the other hand, encourages their customers to use less energy more efficiently. The main conditions for establishing creditability and successfully dealing with Energy Service Agreements are as follows:

- \* the Energy Utility should be convinced that the customer will be satisfied and that the utility itself will make sufficient profit.
- \* the Energy Utility should express its goal and strategies by establishing its own qualified and capable staff.
- \* the Energy Utility should elaborate a system of rates and terms to promote rational energy use.
- \* the Energy Utility should improve its own buildings to provide good examples.
- \* the Energy Utility should actively encourage national and local authorities to establish a creditable long-term policy regarding taxes and necessary rules.

There are several reasons why the customer ought to prefer an Energy Service Agreement. The following are the most frequent ones:

- \* presently unacceptable indoor climate and lighting.
- \* frequent interruptions and problems with the building services.
- \* excessively high energy costs.
- \* problems in recruiting its own qualified operational staff.
- \* the total responsibility on one partner with possibility to terminate the agreement.

It is important that Energy Service Agreements should not be entered into with unrealistic expectations. Therefore one essential circumstance must be emphasized when considering the possibilities to achieve improvements related to the use of energy: The use of energy for heating is mostly dependent on technical design while the use of electricity is to a great extent related to human behaviour.

## 7.5. Barriers

In order to be successful when dealing with Energy Service Agreements we have to consider and overcome some barriers. Under the headings of 5. THE 1994 GENERAL SITUATION and 6. INCENTIVES AND MISSION some of the main barriers are mentioned.

However one further barrier should be emphasized. This is the question of economy and especially its hallmark in modern society and economical growth: the short-term perspective. The construction and the real estate sectors often adopt this approach. Speculation, unfortunately, is an essential part of the economy of these sectors.

When dealing with improvements with the aim of energy conservation, profitability often overwhelms quality and investment costs are evidently given priority compared with operational expenses. The long-term consequences for energy consumption are very obvious.

## 7.6. Intelligent Buildings

Further development of Energy Service Agreement activities means, among other things, using state of the art technology regarding equipment for the control and operation of building services.

Very advanced systems for automatized operations and communications, called intelligent networks or installation buses, probably ought to be used. Not only ordinary building services but also systems for attendance control, locking devices and various alarms will be connected to the buses. Developments in this area are very rapid.

### 7.7. Discussions of reliability and creditability

There are several aspects of this paper which need to be discussed. The main questions are probably the following:

- \* National and local policies.

Which actors and which circumstances will influence national and local authorities to draw necessary conclusions and take proper action?

- \* The ability of the Energy Utilities to adapt from a monopoly situation to future conditions.

How to attain change of paradigm from giving priority to the supply of energy and shift to concentrating on the benefits of energy use?  
What is the key?

- \* Long-term creditability instead of short-term profitability.

Which customers should be given priority when considering the benefits of energy use; Energy Service Agreement partnership?

The industrial sector is normally oriented towards short-term commerce and is very influenced by international trade conditions. Owners of buildings have good reasons to manage their real properties in a long-term perspective. As energy utilities traditionally are long-term actors as owners and operators of large production plants and distribution systems it seems suitable to look for a closer form of cooperation especially with long-term owners of buildings.

- \* Good examples.

Successful practical examples are important and necessary to attain creditability and to set a standard worth following.