An Organizational Culture Perspective on the Role of Swedish Energy Utilities in Promoting Energy-Efficient End-Use Technologies

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The role of a Swedish energy utility in promoting demand side management (DSM) measures is discussed from a psychological and organizational point of view. Twenty-seven members from different parts and levels of a large energy utility were interviewed. The leadership of the utility strongly supported the promotion but were frustrated because the process of creating promotional activities was slow. Interviewed members of production and distribution departments endorsed the promotion, however, several members of marketing departments performing the work were uncertain if the company really supported DSM. Some of the interviewees claimed that leaders of marketing departments had not been clear or expressed doubt about promoting such measures. The paradox, that the leadership supported DSM but the members performing the work doubt it, may be understood by analyzing the deep organizational culture in the company. The organizational culture, taken for granted, shapes the patterns of perception, thought and feeling of every new generation in the organization and may act as a barrier against the successful promotion of DSM measures because the utility's main task, selling energy carriers, could otherwise be threatened.

Introduction

The links between energy systems and environmental impact, global security, development, and economic growth have led to demands for major changes in the present energy systems, and in particular for increasing the energy efficiency and the use of renewable energy (United Nations 1989 and 1992). Studies of energy systems at global, national, and local levels, show the significance of a shift towards renewable energy and energy efficiency, and that the economic potential to increase the energy efficiency is large even without considering external costs (Brinck et al. 1992, Goldemberg et al. 1988, Gustavsson, 1994). It is well-known, however, that for consumers profitable improvements in energy efficiency are often not implemented (Olerup 1993).

Energy utilities can contribute to increasing the implementation of energy efficiency improvements. Utilities in the United States have promoted energy efficiency improvements by using DSM programs. Implementation of such programs has been more beneficial to the utility than increasing production capacity. The primary reason for launching the programs is that costs for energy efficiency are lower than the costs for new generating capacity. Regulators in the United States have also increasingly scrutinize the construction of new central power stations and require the utilities to provide the consumers with least-cost energy services. Thus, the utilities must justify such investment for the regulators in order to ensure full recovery (Geller 1989). Regulators have also ordered utilities to implement DSM programs and used financial penalties if the programs are not implemented (Nadel 1992).

The Swedish utilities are operating on a nearly monopolistic market and can build new generating capacity and increase electricity prices instead of using DSM programs. Thus, the regulation of the Swedish electricity sector does not motivate the Swedish utilities to promote DSM programs, and the incentives for utilities to promote such programs are rather weak partly because current electricity production capacity in Sweden is excessive and based almost exclusively upon nuclear and hydro power with low variable costs.

The parliamentary decisions in Sweden that nuclear power, which now provides about half of the electricity

and one third of generating capacity, will be phased out by the year 2010 will result in construction of new generation capacity. The Swedish government proposed in 1988, after the accident in Chernobyl, that two nuclear reactors be phased out in the middle of the 1990s. The proposal, however, was cancelled and state support to develop renewable energy technologies and energy-efficient use of electricity was adopted instead. The importance of energy efficiency, nonetheless, was increasingly noticed within the energy sector and some utilities started to carry out DSM programs. Many Swedish utilities are owned by municipalities and can, therefore, be influenced to carry out DSM programs for political reasons.

The traditional role of Swedish utilities has been to deliver energy carriers to a mainly monopolistic market at low costs with a high reliability. The organizational culture of the utility created under these circumstances may not be suitable for promoting DSM programs or other measures used to improve energy efficiency at the end-use. Thus, organizational changes of utilities may have to be performed to facilitate the promotion of DSM.

In this study, psychological and organizational conditions for a Swedish energy utility to promote energy efficiency improvements are discussed. The utility is owned by a municipality. Twenty-seven members from different parts and levels of the company were interviewed. The objective of the interviews was to describe opinions about energy efficiency improvements within the company as well as basic values and the main task for the utility.

The Concept of Culture in Organizations

The culture concept may be useful for understanding the conditions and possibilities to adapt an energy utility in a changeable environment; see for example Schein: "My own experience and many of the recent writings in the field of organizations development all suggest that an examination of culture issues at the organizational level is absolutely essential to a basic understanding of what goes on in organizations, how to run them, and how to improve them." (Schein 1989, page 30).

The term culture has many different meanings and is used in several different ways, such as norms that evolve in groups, regularities in people's behavior when they interact, the philosophy that guides an organization vis-à-vis workers and customers, dominant values espoused by an organization. Here, culture is used for deeper phenomena within organizations that reflect basic assumptions and beliefs which are shared among the members in the organization but are working on an unconscious level and therefore taken for granted. These basic assumptions and beliefs define how the organization looks upon itself and its environment. They are learned responses to the company's efforts to survive and solve external problems and problems of its own integration. The external problems are problems which are created when the company is trying to carry out its main task efficiently in a changeable world. The main task justifies the existence of the company. Problems involving a company's internal integration, the process of creating and maintaining the organization, must be solved continuously to enable the company to concentrate on its main task (Schein 1984, 1989).

The culture in a company, solving the external and internal problems, will reduce the anxiety of the members which always exists in unstable and new social circumstances. The culture has the function that defense mechanisms serve for the individual. "Culture solves problems for the group or organization, and even more important, it contains and reduces anxiety. The taken-for-granted assumptions that influence the ways in which group members perceive, think, and feel about the world stabilize that world, give meaning to it, and thereby reduce the anxiety that would result if we did not know how to categorize and respond to the environment. In this sense culture gives a group its character, and that character serves for the group the function that character and defense mechanisms serve for the individual." (Schein 1989, page 312)

A culture is created when a given set of people have shared a number of important experiences which have solved internal and external problems, giving them a shared view of the world around them and their place in it, and this shared view is taken for granted. In this perspective, the culture is a learned group experience. The creator of the organization typically has an essential role for the culture created in the birth and growth phase of a company. The culture in a company and its function, however, vary with the phases a company goes through from cradle to grave.

The development of a company can be described in three growth phases (1) birth and early growth, (2) midlife, and (3) maturity. The midlife of an organization is characterized by expansion, while the maturity phase is characterized by stagnation. In the latter phase the culture may have become dysfimctional. That could be reflected in a company as obstacles against innovations, glorifying the past and wanting to maintain it. In such a case, parts of the culture may have to be changed if the company wants to be successful. Changing the organizational culture, however, is difficult and will take long time, as the culture reduces and constrains anxiety for its members. The changing process will increase the anxiety in the organization. In some cases, changes are not possible before the problems have reached such an extent that the members

understand that the survival of the organization is threatened. Another obstacle to changing a culture is that the difficulties in the changing process and the time for the process are many times underestimated. The changing process may take five to ten years (Schein 1989).

Field Study

The utility discussed here produces and distributes district heat, electricity, and gas. The total produced quantity of energy carriers are yearly about 15 TWh and the yearly turnover is some $0.8 billion.[1] The utility, created in 1892, has a long history of producing and distributing energy carriers. Until 1990 the utility consisted of two separate units: a production and a distribution company. The distribution unit, nicknamed "the administration", was cost oriented, with complicated and long decision chains. The production unit, nicknamed "the company" and a subsidiary of the distribution unit, was result oriented. Both units were oriented towards administering the capital intensive production and distribution systems, and knowledge about the customers, the market, was nearly totally lacking.

The production and distribution units of the utility were merged into one company in 1990. In connection with the merger a process was started to transform the utility into a market-oriented company focusing on the market, the consumer. In the official version of the utility's direction during the 1990s, the market orientation and the development towards an energy service company was strongly emphasized. In this process eight theses were formulated and distributed within the organization from the leadership. The eight theses which should guide the personnel in their daily work are as follows:

- Reliable energy supply with high quality
- Energy conservation and efficient energy use
- Internal and external environmental improvements
- A complete energy service company
- New knowledge - Research, Development, Demonstration
- Improve the company's role on a regional and national level
- A strong economy to create freedom of action
- Develop the staff and the organization

The leadership also declared that throughout its century-long history the company had become good at energy-efficient production and distribution, but that it was time to work for a more energy-efficient end-use - a new energy culture was now created in the company. The whole chain from primary energy to energy services should be energy efficient. But the basis was reliable and secure energy supply.

In the field study, twenty-seven persons from different departments of production, distribution, marketing and staff functions dealing with economy, planning, and personnel were interviewed, as well as the labor union. The interviewed persons were selected randomly, and both heads of departments and ordinary workers were selected from different geographical districts. The president and the chairman of the board were also interviewed.

The interviews, partly structured, were carried out during one or two hours and recorded, covering subjects about the company such as basic values, main task, the role of DSM measures, the viewpoints regarding DSM of different departments and among the leadership, conflicts between DSM and revenue and the utilization of existing investments.

The leadership, subsequently interviewed, stressed the process towards an energy service company and the importance of DSM. The reason for DSM is that energy efficient measures at end-user are more cost-effective than increasing the energy supply, as the costs for new supply capacity are high. There have also been problems involving public acceptance of new production plants. DSM measures will also reduce environmental impacts. The leadership, however, was frustrated because the process of creating the promotional activities and the transformation of the company towards a energy service company was slow .

The persons interviewed from production and distribution departments nearly all supported DSM measures. They also claimed that such measures are economically beneficial for the company. They declared, however, that the main task for the company is to deliver district heat, electricity, and gas to the customers reliably and cheaply.

The head of production in one of three geographical areas claimed, "We support DSM, a decreased energy use at the consumers, as that will decrease the investments in new production capacity." When I asked "But if you decrease the energy use might there be a risk that you cannot use your new production plant?" he answered, "So would a private director say, but our company has a mandate formulated by our citizens that we should decrease energy use." . . . "Our production unit cannot do so much about DSM, we are onlookers, but the message has really been given by our president."

The head for district-heat distribution in one geographical district claimed, "We support DSM even if we have over capacity in our production system because we can sell district-heat to other municipalities."

The marketing departments are responsible for selling district heat, electricity, and gas as well as for DSM measures. This has created some problems as it had been difficult to explain to and convince the customer to reduce his energy use when the aim is also marketing energy. It has also been confusing for the marketing staff to promote DSM programs, as the main task for the utility is to supply the customer with reliable and cheap energy.

Several of the interviewees at the marketing departments were also uncertain if the company really wanted to promote DSM or if it were more of advertising value. Furthermore, some of those interviewed felt the lack of an overall policy on DSM programs and were afraid that such programs might be temporary if they were not profitable enough, which could lead to unemployment for those working with the programs. Some of the interviewees believed that the head of the department could be against DSM measures and were uncertain if they really should work with such measures. The head of one marketing department declared, when interviewed, that DSM measures should not be used for district-heat consumers as this would reduce the utilization of existing district-heat production.

One project-leader for DSM claimed, "I lack an overall policy for DSM and I want to know more clearly what we should do. It is so nicely written officially that we shall save 600 GWh of energy. But we are not at all after energy savings; we want to save peak-load. With peak-load we can make money. The head of our department could not tell us the goal of the department and what I was going to work with. . . . The peak-load is steering our company. In my small project we have problems with electricity capacity, if the demand increases we will have to rebuild the transmission system and that costs a lot of money. That is important, that is economy for the company, not spreading a message to save energy on a general level, it is woolliness. . . . It is unclear what the company wants. The rate of return is 12%. DSM measures would decrease revenues, create unemployment, and decrease our competence."

Another project-leader for DSM claimed: "The profit is the important thing. If there are two things we can do, we will do the most profitable one. Saving energy is not profitable for our company to work with, it will decrease our revenues. But it is a political requirement and it can create some goodwill. It is a bloody dilemma. If you save energy, you beat yourself. It takes our revenues. The best thing is if consumers waste energy."

How to evaluate the impact and estimate the value of DSM measures from the utility's point of view was not clear within the utility. The economic value of DSM measures had not been formulated in operating terms. This may create uncertainty about the status of DSM within the utility, even if the lack of such means depends on the difficulties of creating them.

Thus, the leadership strongly supported the promotion of DSM measures but were frustrated because the process of creating the promotional activities was slow. Interviewed members of production and distribution departments endorsed the promotion, but the members of marketing departments performing the work were uncertain if the company really supported such promotion.

The energy utility studied here is one hundred years old, and it is in a mature growth phase. The organizational culture created during the utility's traditional role of delivering energy carriers reliably and cheaply shapes the patterns of perception, thought, and feeling of every new generation in the organization. This culture, taken for granted, may act as a barrier against the promotion of DSM measures, as the main task, selling energy carriers in a nearly monopolistic market, might be threatened. The culture may be changed but it will take long time. The creation of the marketing departments and the process of changing the utility into an energy service company appear to be elements of such a process.

Conclusions and Discussion

Typically, the main task for a traditional Swedish energy utility has been to sell energy carriers to customers cheaply and reliably on a nearly monopolistic market. Swedish utilities have mainly been administering the capital intensive production and distribution systems, while knowledge about the consumers, the market, has been nearly totally lacking. An organizational culture that is suitable for such a main task and role for the utility has been created.

The field study of one utility indicates that the existing culture, taken for granted, may act as a barrier against the promotion of DSM measures because the utility's main task, selling energy carriers, might be threatened. A process has been started within the utility which may lead to a changed culture, one more suitable for a market-oriented energy service company. Changing the culture in an organization however, is a difficult task which takes a long time, perhaps five to ten years, and the leadership will play an essential role in the change process. If the culture hinders the DSM measures and is not adaptable, one solution may be to create a subsidiary with the main task of promoting energy efficiency improvements at the end-user.

Current regulation of the Swedish electricity sector does not motivate the Swedish utilities to promote DSM programs, and the incentives for utilities to promote such programs are rather weak, partly because new production capacity is not needed. It has been proposed that regulation of the Swedish electricity sector be changed to create competition among the electric utilities (SOU 1993). The role of DSM on an electricity market with competition among the utilities is not clear. Electric utilities may concentrate on the core mission to produce and sell electricity and that can make utilities more reluctant to carry out DSM measures. The interviews here were carried out before the proposed deregulation and the proposal has not influenced the results in the field study.

This study shows that it may be difficult for energy utilities to carry out DSM even if the leadership strongly support DSM. A deregulation of the electricity sector leading to reluctant towards DSM by utilities would properly result in very weak position for future DSM measures.

Acknowledgements

I gratefully acknowledge the economic support provided by the Swedish National Board for Industrial and Technical Development. I thank Willett Kempton and two anonymous reviewers for helpful comments and ideas.

Endnote

1. 1990 prices, $1 = SEK6.

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