

Energy Conservation - a Task for Utilities?

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1. SYNOPSIS

Utilities role on energy conservation would probably diminish if these activities were paid by money from a fund accessible to everyone.

2. ABSTRACT

Both in some states in the United States and in some European countries utilities play an important role in fulfilling national goals to improve energy efficiency and reduce environmental impacts of electricity consumption.

The vendors of electricity work so intensively to reduce customers' demand for their product for typically three major reasons: It is - for different reasons - profitable to do so; they do so in order to get goodwill - or they are simply forced to by the authorities.

Until some years ago the function of electric utilities primarily was to be able to supply the steadily increasing demand for electricity. This was the parameter of success - or directly economic incentive to the investor owned utilities.

On this background it seems natural to create the reverse situation: Make utilities interested in selling less electricity. And this is what has happened among the regulators on both sides of the Atlantic.

Since electricity is sold through natural monopolies it is easy for regulators to encourage utilities to raise their prices to finance energy conservation activities.

However, it is questionable if utilities always deliver the best and cheapest energy conservations. Utilities tend to give precedence to investments that are in their own self interest and not social optimal. Consequently, it should be considered to direct the money collected for energy conservation by utilities to a fund open for everybody. This would make it possible for utilities, consultancy firms and users to compete on delivering the best and cheapest energy conservation.

3. INTRODUCTION

In the United States as well as in Denmark and in other European countries the utilities play an important role in fulfilling the national goals on improving energy efficiency and reducing environmental impacts of electricity consumption.

But why do vendors of electricity do such an intensive work to reduce customers' demand for their product?

Depending on who you ask, you get answers ranging from "utilities promote energy conservation on their own initiative because it is a profitable activity" - to "utilities only do so because they are forced to by the authorities".

During our work in the Confederation of Danish Industries, we have tried to come to a better understanding of the question: Is utility driven energy conservative programs the best solution on society's demand for energy savings? And in this connection: Why do utilities behave differently from all other suppliers of energy by reducing the demand for their products?

"Normal" vendors will always do everything possible in order to increase the total demand for their products. It might be a part of a marketing strategy to help customers to a more optimal usage of the product, but in such cases the intention is to be more competitive compared with alternative suppliers. This is e.g. the case when Danish oil companies offer efficient oil burners to their customers. Even if these efficient oil burners reduce the sales volume to the individual customer, the total volume of sales are expected to increase through this service.

Although utilities are responsible for some of the most progressive and competent work on improving energy efficiency we feel a strong uncertainty whether utility driven promotion of energy efficiency would play the same dominant role, if other parties had the same access to economic resources as utilities. Some other important questions are: will society reach all its goals for energy savings if it only relies on utilities' initiatives? And are utilities in any cases able to achieve the best and cheapest savings for society?

The attempts in this paper to answer this kind of questions are not based on a scientific study but on our observations during the work in the Confederation of Danish Industries on energy planning and energy policy combined with the impressions from more than 40 interviews with individuals in the American energy sector carried out during May and June 1994.

4. SOCIETY'S MEANS TO INVOLVE UTILITIES IN ENERGY CONSERVATION

In Denmark as well as in the States you cannot expect all profitable energy savings to be introduced spontaneously. At the same time it is a common fact that until now the function of electric utilities has been primarily to be able to satisfy the steadily increasing demand for electricity - and this has been their parameter of success. In the United States the growing demand for electricity has also been an economic incentive for the investor owned utilities.¹

From an energy saving point of view it, therefore, seems natural to create the reverse situation: Make utilities interested in selling less electricity. And this is what has happened among the regulators in both countries. In many cases this trend has been referred to as making "Negawatts" as attractive as "Megawatts".

4.1 Means to Make Utilities Active on Energy Conservation

The method of making utilities active on demand side management varies much from place to place.

In many years the Danish utilities' activities were mainly based on consensus: The utilities knew the expectations of the politicians in Parliament and Government and acted according to this. Today the Parliament has passed a law on integrated resource planning (Folketinget 1994) which mandates utilities to reduce customers' demand for electricity if this is cheaper for society than establishing of new generation capacity - though the introduction of this new law has caused no significant changes in utilities practice in the first year after it was given.

In Wisconsin the regulators simply told the utilities to implement energy conservation activities to a given extent - otherwise permission to build new generating units would not be given.²

Regulators in states like California, Massachusetts and Connecticut made great efforts in order to encourage utilities to reduce demand for power. This was e.g. done by allowing them better profits on investments in energy efficiency compared with the accepted profits of investments in the supply system.³

In Massachusetts the authorities have given utilities a relatively unique incentive for energy efficiency programs: All over the United States it is possible for trade permissions to emit ozone and NO_x in areas which do not meet the federal air quality standard. The traded pollutions "credits" are typically created by installing additional pollution controls or reducing the number of operation hours at a facility. The unique approach in Massachusetts allows utilities to create air pollution credits through implementation of energy efficiency programs.⁴ Regulators in many states in the U.S. have furthermore reduced utilities incentive to increase sales through a decoupling of sales and profit. In these states utilities' profits in principle depend on the estimated sales as if no activities to reduce demand for power were carried out. Consequently, the profits do not decrease when sales decrease - and in some cases e.g. in California the profit actually increases because society's total savings due to the implemented energy savings are shared between society and the shareholders.⁵

4.2 Problems

It is easy for electric utilities to finance activities to reduce demand for electricity. Much easier than other companies who might have the same competence on energy efficiency e.g. consulting engineers. The reason is that utilities in both Denmark and the United States are natural monopolies, which means that the utilities are able to let their customers finance energy conservation activities whether the customers have an interest in this or not. In both countries you can find examples of (large) customers who do not want to contribute to the utilities activities on energy conservation. In Denmark some industrial customers have stated that they if necessary would be able to spend more resources on energy efficiency for a better output than they get from the local utility's energy efficiency

program. Similarly, some large industrial customers in the U.S. testified in court against regulators right to mandate utilities to spend money on energy conservation. The companies argued - with some right - that they already had done everything to reduce their demand for power and that they knew what was most efficient for them, so they did not need assistance from the utilities.⁶

The easy way to finance energy efficiency activities might be more complicated if a competitive market for electricity is created. This is why some environmentalists in both the U.S. and in Denmark regard competition in the electricity sector as fatal⁷. Preliminary experiences from Norway show that utilities in the first years on a competitive market have stopped their activities to reduce customers' demand for power (York 1993). Nevertheless this experience does not prove that utilities cannot be the driving force in energy efficiency.

5. UTILITIES' OWN ARGUMENTS FOR REDUCING DEMAND FOR POWER

A common argument in the United States for utilities' energy conservation programs is that reducing demand for power is a method to avoid increasing prices. Vertical integrated utilities with own power plants and own distribution networks explain that it in many cases simply is cheaper to release extra capacity through energy conservation than getting extra capacity through investing in new production facilities.⁸ For utilities with no generation of their own - especially municipal utilities - the arguments for reducing customers' demand for power are based less on economic rationality and to a larger extent on political arguments e.g. environmental or social policy.⁹

In California a large investor-owned utility explained that they had to reduce costs through reducing its customers' demand for electricity in order to avoid competition on production of electricity. The price of new capacity was so high that the establishment of new production facilities would result in increasing prices. And the consequence of higher prices would be that large customers would start to produce power themselves - with the "unpleasant" side effect that the utility by law was forced to buy excess production from the private plants.¹⁰ Without being expressed explicitly this argument is based on a very important premise: that reduction in sales due to energy conservation programs does not result in reduced income for the Californian utilities.

Likewise Danish utilities argue for activities on energy conservation by referring to long-term marginal costs being higher than the actual average prices paid by the customers. Though the interesting thing is that the same utilities claim the opposite to be true when calculating the value of power from independent power generators. In these cases the long term marginal price is considered as being lower than the average price paid by customers (Engell and Duus 1990).

The behaviour of utilities in the States and in Denmark do not prove that the reduction of customers' demand for power would be profitable if no public regulation more or less forced utilities to do this. In some cases it might have its own economic rationale, but in most cases utilities' attempts to reduce the demand are a 'political choice'. This is indicated by the Danish example, and in the U.S. the necessity of decoupling sales and profits indicates that these kinds of activities would not have the same volume if reduced sales resulted in reduced income. It seems as if the criteria for starting an energy conservation activity in most cases primarily is that the direct utility costs are lower than alternative investments in supply. It is not a condition that all customers - participants as well as not non-participants - benefit from this activity.

In addition to the fact that utilities can reduce demand for power, it is also argued that American utilities can strengthen their competitive situation or increase their market share through helping customers to reduce their demand for alternatives to electricity - and at the same time reduce the over-all energy consumption. Examples are information on electric heat pumps and rebates to insulation.¹¹ To some extent Danish utilities do the same kind of activities e.g. promote electric heat pumps, but in these cases only the consideration of reduced total energy consumption is mentioned explicitly.

In some cases American utilities' activities on energy conservation even have a social aspect. This is e.g. the case in some of the Californian programs on insulation of residential houses.¹²

One last type of arguments from utilities for reducing customers' demand for power is common on both sides of the Atlantic. It is good PR and help utilities to a better - more green - image. You cannot quantify the benefits of this, but it was mentioned that satisfied customers pay their bills more regularly, and business customers would be more inclined to ask for advice, which on their hand gave the utilities valuable information. On top of this a positive image simply made life easier for utilities with less criticism in the press or from customer groups.¹³

6. UTILITIES DO NOT ALWAYS WANT TO REDUCE DEMAND FOR POWER

Utilities' positive attitude to reducing demand is concentrated at the level of the managers of the relevant programs. But even if utilities through price regulation make a lot of money reducing demand for power - and are enjoying a good press - the top executives of the American investor-owned utilities might be able to see that this does not work in the company's long term strategy plan.

Generally - in both America and in Europe - it is not absolutely clear whether utilities doing demand side management are primarily interested in reducing their sales or in improving their customers benefit of the power they purchase. The Swedish utility, Vattenfall AB, has relatively explicitly stated that the goal of their ambitious energy efficiency project (Uppdrag 2000) primarily is to improve the usefulness of electricity for the customers. One very important reason for this is that Vattenfall wants to strengthen the links between Vattenfall and its customers. (Eklund 1994)

Of course energy savings have the same value whether they are the primary goal for an activity or merely comfortable side effects of utilities' attempts to improve customer relations. One just has to be aware that in some cases a conflict can occur: reduction of the demand for power can as a consequence have a loss of customers. Customer-related activities might also result in increased demand for power.

In Denmark we recognize the dilemma, when discussing the extent to which utilities should subsidize conversion of space heating from electric heating to for example district heating based on cogeneration. Although this would be one of the cheapest and most secure methods of avoiding demand for power, utilities have in some cases declined to support it.¹⁵

7. ARE THE UTILITIES THE BEST TO REDUCE DEMAND FOR POWER?

Society has the largest benefits from energy conservation when the activities are optimized in a way that gives the largest improvements of energy efficiency at the lowest costs. As long as utilities are able to provide optimal results, energy conservation should be the responsibility of utilities.

The question is though if utilities in all cases are able to provide the optimal results. The standpoint that utility driven activities on energy efficiency often is too expensive in view of the results is commonly expressed.¹⁶ Among other reasons this is due to the fact that regulators make too strong regulations of the type of activities, utilities should carry out.¹⁷

In industry it is becoming increasingly common to 'out source' activities not being a part of the companies' strategic key competences. That is to let other companies carry out certain activities for the company. This could for example concern internal functions as catering or cleaning - or parts of a manufacturing process.

In Denmark most utilities have chosen to employ their own staff to take care of energy conservation, and e.g. have their own consultants for doing energy audits in industry. Only few (primarily municipal) utilities have chosen to use private consultants for this kind of activities.

In the United States as well it was not common for utilities to consider 'out sourcing' demand side management activities. To what extent should the individual utility do all the activities itself and when would it be wiser to buy these services from companies with these activities as their key competence? Some utilities did - similar to a few Danish utilities - use private consultants for energy audits.¹⁸

During the interviews in the U.S. only one example of systematic considerations on whether utilities themselves should be responsible for the energy conservation or if they should buy the services from other companies was met. This example concerns the few cases where American regulators force utilities to make competitive bidding on these kinds of activities. As an example California Public Utility Commission has on few occasions acquired utilities to make biddings for demand side management activities.¹⁹

8. OTHER PARTIES COULD MAKE ENERGY CONSERVATION

In the U.S. many efforts - e.g. the 'decoupling' of sales and profits - have been carried out in order to eliminate utilities' incentives to sell more and more power. Similarly, Danish utilities have been persuaded to reduce the demand for power. At first through voluntary activities and today through mandatory 'integrated resource planning'.

In both countries there is a consensus that collecting money and spending it on demand side management is society's responsibility. However, the question remains: Are the electric utilities the most efficient executors of this task?

In Denmark we have a tradition for strong governmental activity. Since we already have taxes on electricity, most of the Danish utilities energy conservation activities could in principle be granted by governmental subsidies, and thus carried out by anyone of several actors. From the customers point of view there is no difference in paying the present cost of utilities' programs on energy conservation 0,00063 ECU/kWh (0,005 DKK/kWh) to the utilities or as an explicit extra 'energy saving tax' to the government or to some kind of fund. Taxes on electricity is not unknown for customers in Denmark since most companies in industry already pays 0,0063 ECU/kWh (0,05 DKK/kWh) in tax and private households pay up to 0,04 ECU/kWh (0,32 DKK/kWh) in tax.

In the United States it seems difficult to imagine explicit taxes. But the future 'deregulation' might make the present kind of utility driven demand side management more difficult and complicated. Instead the utilities could be forced by the regulators to collect money for some kind of a fund to sponsor activities carried out by utilities today. This kind of ideas have been expressed in California.²⁰

If activities to reduce customers' demand for power are paid by money from a fund accessible to everyone the question is if utilities will still be the major actor in the play. This question is relevant on both sides of the Atlantic.

9. ACKNOWLEDGMENTS

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10. ENDNOTES

- 1 Personal communication with Mike Arny, Wisconsin Public Service Commission and Ewan Woolacott, Connecticut Department of Public Utility Control.
- 2 Personal information from Mike Arny, Wisconsin Public Service Commission.
- 3 Personal information from Dorothy Duda et. al., California Public Utility Commission, San Francisco; John Donoghue, Boston Edison and Ewan Woolacott, Connecticut Department of Public Utility Control.
- 4 Personal communication with Andy Green, Massachusetts Executive Office of Environmental Affairs and Barry Perlmutter, Massachusetts Department of Public Utilities.
- 5 Personal communication with Dorothy Duda et. al., California Public Utility Commission.
- 6 Personal communication with David Fester, Centre for Clean Air Policy, Washington D.C.
- 7 Personal communication with David Goldstein, National Resource Defence Council, San Francisco and (Davidsen and Halkier 1994).
- 8 Based on personal communications with among others: Rich Kallet, SMUD, Sacramento; Kent Harris, Pacific Gas and Electric, San Francisco, Gerry Oppenheim, Boston, John Boos, American Public Power Association, Washington D.C.

- 9 Personal communication with John Boos, American Public Power Association, Washington D.C.
- 10 Personal communication with Kent Harris, Pacific Gas & Electric, San Francisco.
- 11 Personal communication with Rick Tempchin, Edison Electric Institute, Washington D.C.
- 12 Personal communication with Dorothy Duda et. al., California Public Utility Commissio.
- 13 Personal communication with Rick Tempchin, Edison Electric Institute.
- 14 Personal communication with Rich Tempchin, Edison Electric Institute.
- 15 Personal communication with Jørn Mikkelsen, ELSAM.
- 16 Personal communication with Doug Bohi, Resources for the Future, Washington D.C.
- 17 Personal communication with Doug Bohi, Ressources for the Future, Washington D.C.
- 18 For example Boston Edison in Massachusetts. (Personal communication with John Donoghue, Boston Edison and Paul Pimentel, Pequad Associates).
- 19 Personal communication with Dorothy Duda, California Public Utility Commission, San Francisco.
- 20 Personal communication with Peter Bach, the Danish Energy Agency.

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