

Implications of a deregulated electricity market on three major energy efficiency programs in Norway

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Abstract

The Norwegian electricity market was deregulated in 1990. The liberalized Norwegian electricity market has had a major impact on all of the actors in the energy market. Contrary to the original intention, the liberalization has resulted in the necessity for a more active government policy in the domains of energy efficiency and renewable energy. Empirical analysis has shown that the electricity price in Norway was lowered by the deregulation, even though in 1990 Norway had one of the lowest prices for electricity among OECD countries. The low price has further reduced the price incentives both for energy efficiency and renewable energy in Norway. The lower price is a result of a more intense utilisation of the capacity, which in turn means that the reserve margin for supply has declined. In the end this has implications for the security of supply and could motivate a renewed interest in energy efficiency.

In this paper we evaluate the results from three Norwegian case-studies related to energy efficiency and renewable energy, by applying the IEA-method of Policy Triangulation. The three cases are evaluated by looking into market barriers, market transformation and R&D policies. The cases evaluated include governmental programs related to energy efficiency in the period both before and after the deregulation. The paper assesses the impact of the programmes as they pass through a time of changing policy

regimes. The evaluation of the three Norwegian cases gives valuable information on the implementation of technology deployment programmes in a deregulated electricity market. The method of policy triangulation identifies success factors and other relevant characteristics from the cases. The results have important applications for energy policy and program design.

Introduction

Energy efficiency policy in Norway throughout the nineties has gone through several stages and regimes. At the same time the Norwegian electricity market has been deregulated, also in a process that has gone through several stages. In this paper we see these two processes from a common viewpoint, as we try to evaluate the impact that a common deregulated market has had on three Norwegian energy efficiency programs in this period. In this part of the discussion we will mainly focus on the impact of low electricity prices on the energy efficiency programs. The method of policy triangulation (Nilsson and Wene, 2001) is used in order to evaluate the three cases. The paper evaluates the cases in order to identify barriers, technology deployment and market transformation. The three programs are:

- **Case A:** The Energy Efficiency Check (EEC)
- **Case B:** Technology Introduction (TI)
- **Case C:** The Energy Efficiency Fund of Oslo (EEF)

The analysis of the programs is seen in connection with the development of a deregulated electricity market in Norway

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in the same period. The next section briefly summarizes the development of the Norwegian energy efficiency policy in the 1990s. The subsequent section summarizes the method of policy triangulation for program evaluation, followed up by an analysis of three Norwegian energy efficiency programs that have been carried out in this period. The last section contains a summary and conclusions.

Norwegian energy policy efficiency and the impact on energy efficiency in the 1990s

EFFECTS OF THE LIBERALISATION

The Norwegian power market has formally been open to competition since 1991. A real opening of the market was not established until 1995, when the demand for hourly metering to change supplier was removed. An adjusted feeding profile has been employed for end users who are not hourly metered. The fee to change supplier was in 1995 246 NOK (33 Euro). In 1997 this fee was completely removed.

In general there are two types of contracts that Norwegian household customers may sign with their supplier called *fixed* and *floating price contracts*. For a *fixed price contract* the customer sign a contract for 1, 2 or 3 years, with the price offered by the supplier at the time the contract is signed. For *floating price contracts* there are three different types of subgroups of contracts: *Variable power price*, *spot price* and *guaranteed price*. With a *variable power price* contract the price is changing according to the market price, which in Norway depends heavily on climate variations. A price change from the supplier must be announced 14 days in advance. With a *spot price contract* the customer will receive a price that follows the daily average of the power price exchange, with an addition of taxes and with a mark-up paid to the power supplier. A *guaranteed price contract* gives the customer a guaran-

teed ceiling that the power price cannot exceed for the period the contract is signed.

The Norwegian Directorate for Water Resources and Electricity (NVE) has published a technical report that describes the process of the opening of the Norwegian power market (Jonassen, 1998). The report gives a comprehensive presentation of the main events that has taken place in this process.

As we can see from the end-user prices that are given in Figure 1, the real electricity prices for almost all end users have been slightly decreasing in the period from 1990-1999. This situation is as expected the first years in a deregulated power market, since the power companies are able to push their margins, by reducing investments in new capacity. In a free market they are no longer obliged to cover a certain amount of the expected demand for electricity in a region. They can instead choose to buy electricity from other power companies in periods of deficiency, or sell in periods with high prices and expected surplus. In this way a deregulated power market is supposed to facilitate the most efficient way of managing the power market. There is however reason to believe that a deregulated market creates too few incentives to invest in new power capacity, since heavy investment decisions are relying on future price expectations, and only short periods with a certain shortage of capacity can generate such prices. It is also interesting to observe the diverse development of the average prices of the service and manufacturing sector compared to the household sector from 1997. It seems that large customers from the service sector have taken advantage of using their purchasing power in dealing good long term contracts for electricity, compared to the more fragmented consumer group of the household sector.

In a report from Econ (Econ, 2002) an interesting question is raised: "Are we moving toward a cyclical world?" The thought that is reflected in this report is that price of elec-

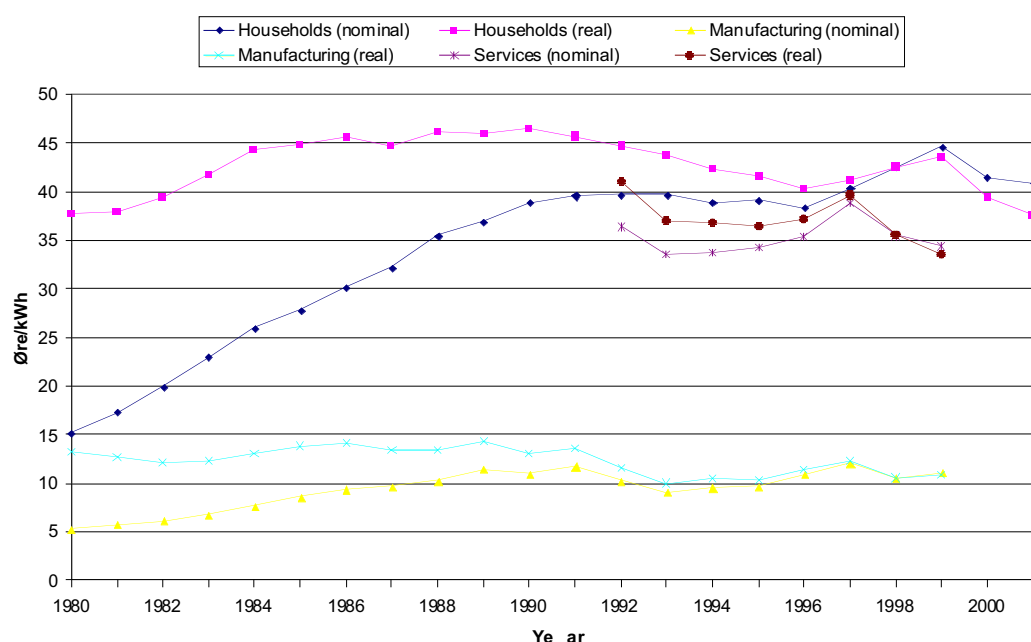


Figure 1. Electricity price development in Norway from 1980-1999. ("Nominal" deflated to 1998 level, "real" not deflated. 10 øre=1.33 Eurocent)

tricity will heavily depend on the investment pattern, a pattern that turns out to be cyclical. In the cyclical world of a deregulated market the electricity price will fluctuate around the cost of new capacity. Such a cycle may for instance be triggered by the introduction of a deregulated power market. The competition and surplus of power capacity result in a price fall. The low prices stimulate demand and leads to a turn in the business cycle. The increased demand leads to higher prices, as the surplus capacity is eroded. New capacity is added as the price reaches the cost of new capacity. This result in higher prices and the demand will be reduced.

In case we believe in the hypothesis stated in Econ's report, the 1990s may in the case of Norway, have been in the first part of this hypothetical business cycle. The surplus of power capacity that Norway had from the old regime has been eroded by increased demand, stimulate by the low prices, as we in the end of the decade were starting to reach the capacity limit. This picture is important to keep in mind as we continue to discuss the energy efficiency policy of Norway for this period. A period that may be characterised by the following three main points:

1. Lower prices and hence lower interest from the Demand Side.
2. Legitimacy of Supply Side (Utility) actions ruled out.
3. New opportunities for 3rd parties.

The effect from lower prices on the potential effect of energy efficiency programs must apparently be negative. When the price on electricity is going down, less attention towards energy efficiency measures are expected. In the beginning of the 1990s there were massive cuts in the governmental support schemes for energy efficiency for all sectors in Norway. This subsidy cuts came after a report that stated that the share of free-riders¹ in the Norwegian energy efficiency program had been about 70% in this period. Both the Energy Efficiency Check (EEC) and the Technology Introduction (TI) programs were initiated after this situation occurred.

Point two is important, as in the case of Norway a large part of the grants for energy efficiency measures have been distributed by local utility companies during most of the period that is discussed here. The utility companies established Energy Efficiency Centres in all Norwegian counties. The Energy Efficiency Centres were among other issues responsible for the Energy Efficiency Check (Case A in the analysis in the next section). In the deregulated market the utility companies no longer have the same incentives for giving advice and financial support in order to generate energy efficient decisions as in a regulated market.

The Norwegian authorities had several instruments for implementing a well-functioning energy efficiency policy. NVE was in the 1990s the public agency that took care of the funding that was used for national energy efficiency measures besides of research. NVE is a directorate under the Ministry of Petroleum and Energy, with responsibility for managing Norway's water and non-fossil energy resources.

NVE has among several other energy efficiency programs been managing a program called Technology Introduction, which is given as Case B in the analysis in the next section.

In Norway there also exists funding for energy efficiency measures in counties and municipalities; in particular in the Oslo region the Oslo Energy Efficiency Fund is administrating a yearly grant of about 60 MNOK (8 million Euro). The Oslo Energy Efficiency Fund is analysed in the next section as Case C.

When it comes to new opportunities for third parties, this is a topic that has been debated as a possible option for creating a market for new services within energy efficiency. Third party financing is a theoretical and logical outcome of opportunities in a deregulated market. There has, however, been very low activity on this field in Norway. Only one or two firms claim to make money on this type of activities in Norway.

NORWEGIAN ENERGY EFFICIENCY POLICIES DEVELOPED

A new national agency for energy efficiency and renewable energy, Enova, was established in Jan. 2002. The long term goals for Enova were defined in White Paper nr. 29 of 1998-99. These long term goals include facilitating an increased production capacity for wind power of 3 TWh, and to provide 4 TWh heat with water based systems, by 2010. When it comes to energy efficiency, a following goal is stated in the White Paper: *Enova shall facilitate a substantial reduction in the growth in energy use compared to what would happen if Enova had not existed.* In Enova's contract with the Royal Norwegian Ministry of Petroleum and Energy, this goal has however materialized itself as a residual term of 3 TWh. This residual term may also include other conversion of renewable energy than from wind or hydro. This gives Enova a total goal of 10 TWh to be provided by the end of 2010. This compares to approximately 10 percent of Norway's electricity use in 2000. Enova will manage of a fund of approximately 500 million NOK (65 million Euro) per year in the period until 2010, to achieve the three goals.

Policy triangulation applied on cases in a liberalised market

THE POLICY TRIANGULATION METHOD

The policy triangulation method is a method of analysing energy efficiency programs. The programs are analysed by employing three different general concepts of what is hindering deployment of energy-efficiency technologies:

- Market barriers.
- Technology learning.
- Market transformation.

The model complex of the policy triangulation model is described in Figure 2. The three concepts described in the model correspond to three different and well-established models.

1. Free-riders here means subsidies given for investments that would have been done without.

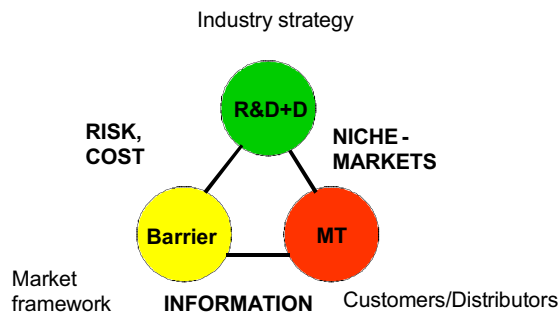


Figure 2. The policy triangulation combined model complex
(Nilsson and Wene, 2002)

The **Market barrier model** is the standard deployment model. The model is consistent with the viewpoint that it is legitimate for governments to intervene in the market to remove or reduce barriers that result from market failures. The types of barriers that may be discussed within the framework of this model are barriers related to:

- Information,
- Transaction costs,
- Risk,
- Finance,
- Market organisation,
- Regulation,
- Capital stock,
- Technology.

The R&D and deployment model. This model is based on technology and organizational learning (IEA/OECD, 2000). The model states that it is legitimate for governments to intervene in a market to avoid future opportunity costs resulting from externalities and under-investment in learning. In this model, measures are chosen based on studying existing technology, market structure (mainly suppliers) and costs, and then relating the observations to the potential for improvements.

Learning curves describes the effect of making a “learning cycle”. Four factors are important to achieve this cycle (Wene, 2002):

- Collaboration between R&D programs and programs for market introduction.
- A market with possibilities for learning investments in new technologies.
- Feedback of experiences forms the learning system.
- Interaction between production and R&D-function in the learning system.

The market transformation model (MT). The various elements of this model are taken from industrial and evolutionary economics, and from the special branch of economics which studies national systems of innovations. In this market perspective deployment policies should transform mar-

kets by stimulating market actors to develop, invest and use technologies with improved performances.

MT differs from ordinary policy measures in the following (Lund, 2001):

- MT policies cause a durable market effect which lasts after the intervention has been withdrawn,
- it is a conscious attempt to change the market,
- if successful, then MT gives rise to an immediate market effect and to major market impact on a long-term run,
- MT processes always show a very active and broad involvement of market actors.

SUMMARY OF THREE NORWEGIAN ENERGY EFFICIENCY PROGRAMS

As mentioned in the first Section, we will here analyse three Norwegian cases of energy efficiency programs that were implemented and carried out in the 1990s. These three cases were implemented by three of the main actors in the Norwegian energy efficiency arena throughout this period, namely the Norwegian Energy Efficiency Centres, NVE and Oslo Energy Efficiency Fund. The three cases are:

- **Case A:** The Energy Efficiency Check (EEC).
- **Case B:** Technology Introduction (TI).
- **Case C:** The Energy Efficiency Fund of Oslo (EEF).

Case A: The Energy Efficiency Check (EEC) is a standardised EE audit for households. The audit itself was free for the customers, but no additional financial incentives were included in this programme. The EEC was first introduced as a priority program in a national EE campaign in 1997 provided by the NVE. Originally the EEC has been developed by one of the regional EE Centres. The EEC has been offered to several counties for some years prior to the national campaign launched in 1997. In a White paper regarding environmental policy for a sustainable future it was an expressed goal that all households of single and semidetached houses built before 1980 should undergo a EEC within 5 years. The EEC has been evaluated by the EU-SAVE program in 2000. The evaluation showed surprisingly that the EEC showed little effect when used in mass distribution. The EEC is the energy efficiency tool of the residential sector that has required the most resources in the last years, both its goals and effects have been disputed. The most important findings from the evaluation were:

- The EEC used in mass distribution had little effect.
- The test group who had not received the EEC seemed to have implemented most EE measures.
- A considerable share of the participants had already taken EE actions and wanted to confirm that they have done right.
- Increased knowledge by the participants is documented.
- From the evaluation it seems that the problem of self-selection among the participants in the EEC is more evident than anticipated. The evaluation suggests that the participants already are “best in class”. Savings or lack of

savings might therefore be due to the background of the participants rather than the EEC itself.

Case B: The Technology Introduction program has had as its goal to achieve energy saving and increased use of renewable energy sources by providing economic support² to market introduction of energy efficient technology and solutions related to renewable energy. The program has been evaluated by Institute for research in Economics and Business Administration (SNF). The yearly budget of the program has been on about 10 million NOK/year (1.3 million Euro/year) in the period from 1994 to 2001. It has been given support to about 150 projects with a total amount of 70 million NOK until 2001 (9.3 million Euro). The program has not been limited to specific technologies or products. Also the introduction of new services related to energy efficiency or renewable energy has received support from the program. The program gave up to 50 percent project support, for technology development projects that were in the phase of commercialization. A main characteristic of this program is that it has stimulated the market directly, so that the market can make use of products and solutions that would not have been realized or that would have used a longer time to enter the market.

Important finding from the evaluation of the program:

- Ripple-effects for energy savings must first be accounted 3-5 years after the project is ended.
- Direct effects for energy savings can be calculated by the end of the project.
- Industrial consequences can be achieved by increased turnover, new employment and export.

A rough estimate of the energy results from 19 participating firms with 32 projects from the program showed a direct effect of 150 GWh and secondary effects accounted for about 900 GWh. The savings includes both electricity and heat

and a wide variety of technologies. This shows that it is important to count “spin-off” effects from the programs.

Case C: The Energy Efficiency Fund of Oslo (EEF). The primary goal of the EEF was to stop the growth in Oslo’s energy consumption. The EEF was established in 1982, on the basis of a resolution in the city council of Oslo from 1981. The EEF should manage about 60 million NOK/year (8 million Euro/year) in a period of 10 years.

Main activities related to the EEF:

- Education and training,
- Energy auditing,
- Campaigns,
- R&D and Deployment-projects,
- Evaluation.

The EEF has built its activities on high technical competence. The goal has been to achieve durable efforts for effective stationary energy use. The program support energy saving regardless of energy source. The program covers all parts in energy efficiency projects:

- Initiation,
- Elucidation,
- Accomplishment,
- Finalization,
- Management.

The EEF has given out grants worth 300 million NOK (40 million Euro) in the period from 1982 to 2001. The registered (estimated) energy savings in the same period has been on 840 GWh/year, no type of energy excluded. Controls show however that: i) some of the estimated savings have been taken out in increased comfort and indoor climate

Table 1. Market Barriers attacked by the programs

CASE ID	Short Name	Information	Transaction cost	Risk	Finance	Market Organisation Split ⁴	Market Organisation Bias ⁵	Market Organisation Cost ⁶	Market Organisation Traditions ⁷	Regulation	Capital Stock	Technology
#A	EEC	X	X						X			
#B	TI			X	X			X	X		X	X
#C	EEF	X		X	X	X	X	X			X	X

4. Split incentives: Owner, designer and user of the technology are not the same.

5. Biased calculation: Payback times used in savings calculations are too short.

6. Costs: Small volumes of new technologies with good performance can not compete economically with incumbent technologies.

7. Tradition: Established companies guard their market position and market share.

2. An economic support of maximum 50% of project costs.

and ii) a considerable amount of energy efficiency investments are not reported and included in the estimated savings.

ANALYSIS OF AND DISCUSSION

Market Barriers

All of the three Norwegian programs that are mentioned above are trying to attack and reduce barriers through its instruments. The barriers that are attacked are mentioned in Table 1. The programs attack barriers with different degree of success. Case A, the EEC, are first of all attacking the huge barrier that lack of information can bring. The evaluation of the program shows that it does so in a very inefficient way, by not being targeted or timely for the participants. The EEC as mass distribution was performed in a period with very low electricity prices. Probably the effect of the EEC would have been better in a period with higher prices and more interest toward the theme.

Case B, the TI program has not primarily been a program designed for attacking barriers, the program is however attacking barriers related to risk, finance, market organisation, capital stock and technology. Related to the target group of the program the reduction of financial barriers is the most important contribution from this program. Contributions to marketing of new products have also been given through this program, since several new products may benefit from increased knowledge of the products and solutions that have been supported. The buyers of the new products that have been supported by the TI program are also interested in knowing the yield of the investments. In this case the alternative price is often heavily dependent on the electricity price, and the low Norwegian electricity price has in this case been one of the most important barriers towards this type of products.

Case C, the EEF of Oslo has had a broad range of activities, and is handling all types of projects related to energy efficiency. Energy efficiency has been a low interest product in Norway throughout the time that the EEF in Oslo has existed. Even in this period with low electricity price a lot of the projects that have been promoted by the EEF in Oslo has shown a good profitability, this implies that price is not the only barrier that matters. In particular the barriers related to information and recognition of value had been encountered as important.

The EEF has created the greatest attention related to its programs for investment support. This has been a door opener to several branches. The program is also connected to a public agency that has had confidence in the market. When a product receives support from a public agency this gives a certain credibility to the investment.

R&D and Deployment

Case A, the EEC, shows little influence, if any at all, by this part of the model concept in its program implementation. Only the part of the case that relates to program evaluation may be said to be closely related to research. The evaluation of the program indicates that the program has given increased knowledge among the participants. However, in a time with really low electricity prices, as Norway has had in the 1990s, knowledge is not always enough to create action.

Action is more likely to occur when information and knowledge is distributed to customers that are demanding the information, and this is more likely to happen in periods when the electricity price is going up.

Case B is by far the case that is most relevant for this part of the triangulation model. A question that can be raised is whether this program can be seen as a subsidy or a real learning investment. The estimated "ripple effects" show that the program may have generated learning investments in the long run. In this way the program is very effective in creating results. The program has been run in close cooperation with the Norwegian Research Council, to be able to support products that are about to enter the phase of commercialisation.

Case C has contributed relatively little to R&D. It may however be realistic to see some of the investments as learning investments in deploying new technologies. This is because one of the requirements in the program is that the investment support should be used for products that have a better standard than what was the average in the market at the time the project was initiated.

Market Transformation

The analysis of how successful the three cases have been when it comes to market transformation is dependent on how they meet the characteristics presented above in section "The policy triangulation method". But in addition to that, in their design they also have fit into the Norwegian energy culture. This includes for example i) traditionally low electricity prices, ii) quality and flexibility demands caused by almost 100% hydropower production, iii) high technological competence and experience on certain renewable energies like bio-energy and heat pumps and iv) the existing and highly deregulated electricity market.

Case A, the EEC has actively been involving frontrunner consumers by giving them a free audit and a report they can use to make decisions on energy efficiency investment. The program seems to fail to spread this effect to other groups and no durable "snowball" effect has been documented. A limited number and types of actors are involved. Technology suppliers of other companies that could have delivered solutions to the involved building-owners have not been included. No customer – expert relations are established and the program has not been able to change the market in any major way. One further step could have been to highlight certain high-profiled users of the EEC or public buildings. One could expect public building owners to be more willing to 1) include more than strictly economic profits when they invest and 2) public buildings can be excellent examples of good energy efficiency practice.

Case B, TI has focused market transformation of new technology and services in a good way. It is directed to front-runner firms and customers. In this respect the program has contributed to establish some energy efficient solutions as standard in the market place. One important aspect is the focus on the co-operation between the technology producer and the user. Another important quality in this program is the flexibility in the way market introduction is supported. This may vary widely depending on the actual needs in the actual case. Even the TI-program seems to miss means to expand the marked penetration after the first introduction.

Especially are missing buyer-groups, which could have secured a critical mass of technology or service sales. Hence, no major change in the market for any technology has been reported even if good results have been documented.

Case C, EEF have established a very comprehensive set of means to save energy. From a market transformation-perspective it seems especially important that the program have established good standards for energy performance as part of the support. This probably has changed the local market for some technologies, but in general there have been no co-ordination of buyer-groups. A couple of home retrofit-projects are exceptions here. In these cases the house-owners have been organised to co-ordinate the retrofitting in local neighbourhoods. A major challenge for this program is to spread activity wider to secondary customers when the pilot actions have been successful. Explained from a market transformation-perspective, this is caused by the involvement of too few market actors.

With its basis in the city of Oslo, public buildings like schools, hospitals and kindergartens is a very interesting market segment. The experience here is that there have been too serious legal and economic barriers in these sectors to succeed.

Marked deregulation

The three cases were introduced at different times and in different stages of the deregulation process. Case C, The Energy Efficiency Fund of Oslo, was designed more than 10 years before, while case B, Technology Introduction was introduced in an early stage of deregulation and case A, The Energy Efficiency Check was designed later in this development. It is obvious that this has been important for both the thinking and the initial design of the programs and how they have been changed over time. The Energy Efficiency Fund of Oslo was established as a consequence of the energy planning for the City of Oslo. It was based on a least cost philosophy for providing the city with sufficient energy. In the old energy law regime, the energy utility was obligated to produce sufficient energy for the city, and the fund was one of the tools for this goal. The Energy Efficiency Fund program still exist, ten years after deregulation and only minor changes have been done in the way the program works. On the other hand we have seen big changes in the way it is organised and the thinking behind the program. In the first stage up to deregulation the ownership was clearly within the municipally owned energy utility. In 1991 the utility was reorganised to a stockholder company (Oslo Energi AS) and no longer was responsible for supply of "sufficient energy". The owner (the city of Oslo) decided to move the fund (now 650 million NOK/83 million Euro) from the energy company to the city's administration. In 1991-1995 an especially dedicated department in Oslo Energi AS (Energy Efficiency dep.) was operator for the fund. In 1995 the Energy Efficiency dep. was reorganized to a separate company called the regional energy efficiency centre of Oslo and continued as operator to 2000. In 2001 the city arranged a competition for the job and decided to use another company as operator.

Already in 1990 the fund was a self-funding activity where the interest from the capital of 650 million NOK (83 million Euro) were and still is the yearly budget. The

Energy Efficiency Fund of Oslo now works as a tool for a city as a more sustainable community.

This is possible only because the fund was there already and could probably not be established after the deregulation.

Summary and conclusions

The deregulation of the Norwegian power system has removed energy system planning from the map of policy instruments for Norwegian Authorities. At the same time Norway has an energy system that is very dependent on electricity produced from hydropower. The dependence of electricity creates a limited flexibility in the energy system. The electricity dependence also creates barriers for deployment of new energy efficient technology. All these issues need to be accounted carefully when new program for energy efficiency are designed or old programs are evaluated. The method of policy triangulation has shown itself to be a useful method to evaluate the influence of these issues on the three programs that have been evaluated here.

The three programs that are evaluated in this paper are all suffering of weaknesses related to program design. Especially the Energy Efficiency Check (EEC) cannot be seen to fit in either as a program created to attack market barrier, learning investments or market transformation. As we can see from the analysis above the attention towards energy efficiency in Norway has also suffered from the low prices on electricity in the period that has been analysed. The last winter season 2002/2003 we might have seen the start of a turn in this situation. The season has been both dry and cold, and as a result the hydro-power based Norwegian electricity market has seen really high prices. At the same time the EEC is not any longer distributed freely to households. As a result of the high prices there have still been customers willing to pay, in order to be able to perform the EEC. Price is clearly a factor that matters related to the implementation of energy efficiency measures. Increased attention towards energy efficiency is another important factor that triggers new type of behaviour.

Case B the Technology Introduction (TI) program could have been a typical market transformation program, but the program has in several cases shown lack of ability to really help the products to penetrate the market. At the same time there are few heavy actors on the consumer side to be able to aggregate purchasing power of new products related to energy efficiency. This is in contrast to the supply side that has really heavy actors involved in investing money for increased production capacity.

As for case C, Energy Efficiency Fund of Oslo, a very comprehensive set of measures have been used and the program primary fit into the traditional market barrier reduction model of program design. The program also has elements of market transformation and R&D and deployment in it, but the program has not been designed to meet any of these elements in particular.

All the three programs have been influenced by the deregulation process, but in different ways. They have seen major changes in the way they are funded and organised. Case C, The Energy Efficiency Fund of Oslo is still active,

but under a totally different organisation and ownership³. It has survived because the funding comes from an existing fund. Both Case B, the Technology Introduction and case A, the Energy Efficiency Check have been stopped. The reasons are different, but in both cases it has been a result of a change in the Norwegian energy efficiency policy. This change is a result of experiences with ten years of work with energy efficiency in a deregulated energy market.

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3. Ownership here is not necessary legal, but is understood as the body that uses the program to their advantage.