Swedish Procurement and Market Activities — Different Design Solutions on Different Markets

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ABSTRACT

This paper presents will give an overview of how the Swedish programme for energy efficiency is designed to affect market transformation, as well as which factors affect the programme design and how the different approaches perform. The 10-year old Swedish programme for energy efficiency has produced 25 procurements within the residential, commercial and industrial sectors. This programme aims at establishing market transformation and consists of technology procurement and projects supporting market penetration. There is a wide variety of methods in use, each of them are designed according to the market barriers, its actors, decision makers, their interplay, and specific market needs, expectations and conditions.

The combination of different methods and the strength of market forces have made the Swedish programme for energy efficiency successful as a policy option. It has succeeded in establishing some sustainable changes on the market. A key conclusion is that the success of any programme is heavily dependent on the vigour with which it is managed and, in Sweden, supported by The National Board for Industrial and Technical Development (NUTEK) and its trade allies. (NUTEK's activities were taken over by the Swedish National Energy Administration as of January 1, 1998.)

The different programme designs, both more and less successful, are highlighted below with examples. The overall list of procurements, their performance and methods are given in the appendixes. Appendix 1 has a full list of the technology procurement programmes and their performance. Appendix 2 has a full list of the activity packages that have followed each of the procurements.

The Role of Technology Procurement

Since the end of the 80's, technology procurement has been one of the key elements in transforming the Swedish energy system towards increased use of efficient end-use technologies. Until the end of 1997, the Department of Energy Efficiency at the Swedish National Board for Industrial Development (NUTEK) has been responsible for these activities. Following a parliament decision in 1997 to start phasing out the first of twelve Nuclear reactors by mid-1998, a new agency was formed, The National Energy Administration (EM), which took over all of NUTEK's energy-related activities. Although the responsibility for these activities have changed, we will refer to the Department of Energy Efficiency at NUTEK as "NUTEK" in the following discussion.

In the way the Swedish programme for energy efficiency is designed, technology procurement acts as a starting engine for market transformation. It gathers all purchasers' requirements for a given product, including even features other than energy efficiency. It is important to integrate these other features in the requirements in order to make the new product more interesting to the actors involved in the decision making and purchasing. The manufacturer has often-incomplete information about users'

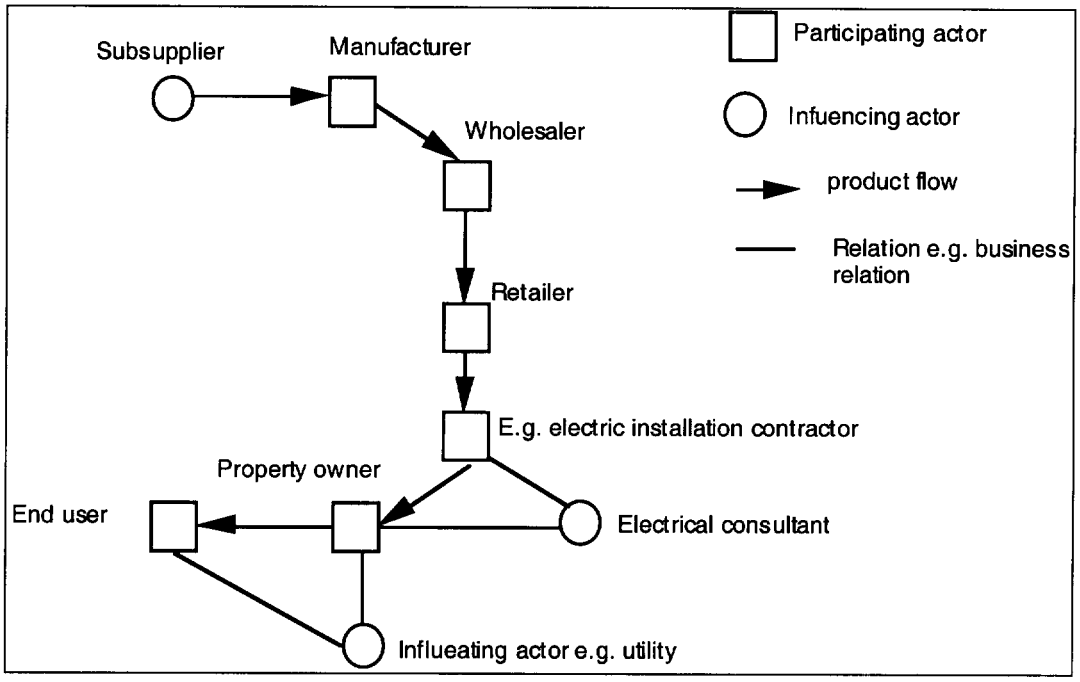

Figure 1. Market Structure for The Procured Products. Source Nilsson 1996.

needs, because the products' flow from manufacturer to the user is influenced by several actors. Manufacturers rarely market directly to users. The intervening actors can be wholesalers, retailers, consultants, or electrical installation contractors, whose main interests might not include energy efficiency. These actors give greater emphasis to business relationships, minimising risk of installation failure, or minimising initial costs.

In order to ensure an improved market share for the procured products, a commitment in favour of these products among all actors involved in the process has to be established. In those cases where the market transformation process is ongoing, the programme produces "ripple effects," such that the different influential actors become a marketing resource for the energy-efficient products instead of creating market obstacles.

Examples of Market Transformation Programmes in Commercial and Public Premises:

Market Transformation on Lighting

The early energy-efficiency programmes within the public and commercial sectors have focused on two main end-uses, lighting and ventilation. The lighting programme started with a technology procurement for electronic high frequency ballast (HF) for fluorescent lighting. It began by *understanding the market and its participants*[1] . Purchases in this market are made by relatively few professional buyers and/or decision makers. The main influential actors on the market are electric consultants and electric installation contractors. The more cautious actors in the early stages of the programme were the lighting luminaire manufacturers.

[1] Emphasis is added to highlight the various methods used in the overall strategy.

The ballast manufacturers' commitment was established by the technology procurement programme through the buyers' groups order of 26 000 HF-ballasts, which was approximately five times greater than the yearly sales of the HF-ballasts prior to the procurement. The winning manufacturer was the one with the best solution for future product development (Stillesjö 1991). The buyers' group was composed of the leading purchasers whose choice of technology strongly affects other purchasers and actors on the market, that is, opinion leaders.

In order to increase the level of knowledge about HF-ballast among the purchasers/buyers and the influential actors, several actions were taken. The concurrent *demonstration project* "Light Corridors" was carried out in several phases and thereby had several additional goals. The project demonstrated installations with a wide geographic coverage. The local utilities were given the option of obtaining a demonstration installation featuring HF-lighting for office rooms and a corridor (Ottosson & Wibom 1997; Pertola & Bångens 1995).

The most important results from this demonstration project were the development of programme *requirements for lighting power density*. These requirements are 10 W/sqm installed in office rooms and 5 W/sqm in corridors. The programme requirements do not only involve energy efficiency, they also contain requirements for visual comfort. After some time they became the common standards among many lighting consultants and electrical installation contractors. (NUTEK *programkrav* ("program design requirement") 1994; Ottosson & Wibom 1997; Pertola & Bångens 1995)

The other result from the "Light Corridors" demonstration project was the development of a *testing method* for the program requirements, which enabled all manufactures to test their product. Studies on HF-lighting's effects on health and visual comfort were also included in the "Light Corridors project."

Moreover, this project also showed the economical results obtained when the initial investment costs were compared to the lifetime operating and maintenance cost. *Life-cycle costing information* was introduced as part of the lighting programme.

Eventually, the lighting luminaire manufacturers began to show a considerable commitment to this. The first published *collection of examples* of high quality, energy-efficient office lighting with luminaires and installation that met the requirements included 34 examples from 15 different manufacturers (NUTEK 1994-11). The latest edition from October 1997 had 61 examples, 15 of them with new, high-efficiency fluorescent strip lighting, T5's. A total of 14 manufacturers had their products tested. (NUTEK 1997-10).

All the information produced by the "Light Corridors project" was widely disseminated by *targeted informational material* and education, as well as by the participants in the project installations. However, these efforts were not enough to get the property owners and administrators to invest in HF-lighting, partly because of the severe recession in the economy in the early 1990s, which had a large effect on the building sector. To tackle this obstacle, NUTEK created incentive agreements whereby the property owners were given a *subsidy* of SEK 1,5 (~US$ 0.2) per each kWh saved in the first year. This money covered only a part of the incremental cost involved when investing in energy-efficient lighting. In order to get this subsidy, the programme requirements of 10 and 5 W/sqm installed had to be met, which was achievable only when HF-lighting was installed. About one hundred incentive agreements were signed. A survey three years later among those who have had incentive agreements showed that 72% continued to adhere to the programme requirements and thereby the HF-lighting systems.

The luminaires with HF-ballast are generally more efficient and give a higher lumen output from the luminaire. Consequently, the number of luminaires per room can be diminished. The HF-lighting is most cost effective when the reduction in operating and maintenance costs is taken into account. This

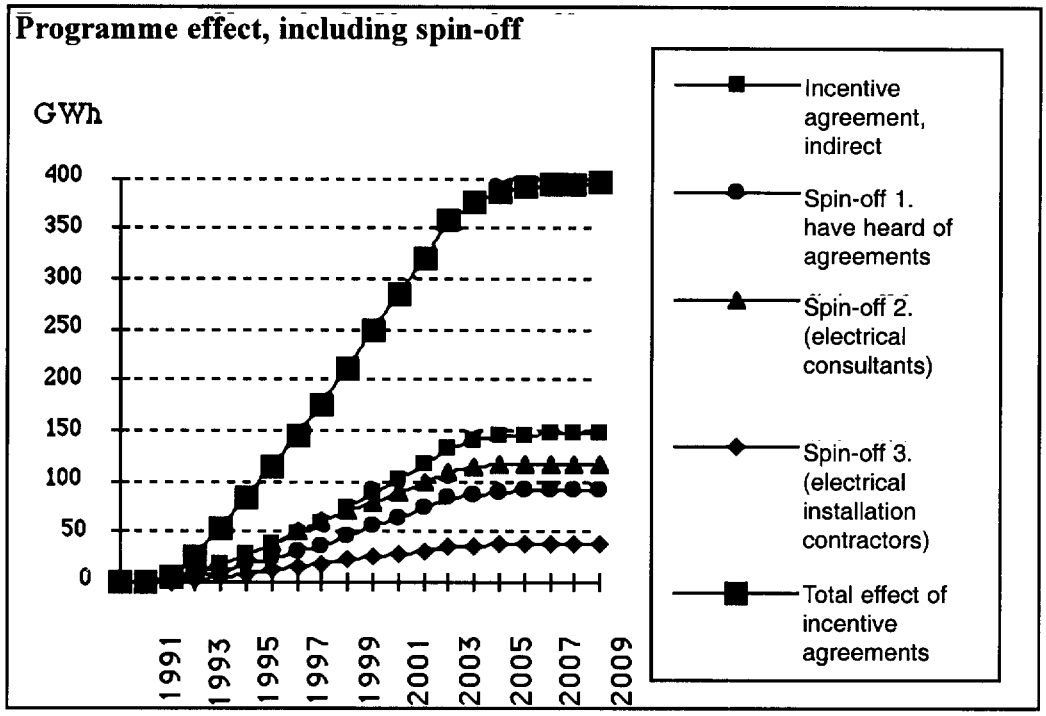

Figure 2. NUTEK's Lighting Programme Effects. Source: (NUTEK 1996; Suvilehto, Alopaeus Sandberg, Nilsson, and Persson 1997).

information is not always easy to communicate convincingly if the operating costs and the investment cost are not assessed to the same budget, i.e., those who pay for the efficiency don't benefit from the operational savings. *A guidebook and seminars*, ENEU 94, on how to succeed in purchasing energy-efficient technology was created in co-operation with the Association of Swedish Engineering Industries. The key information for success is to gather at an early stage all those who might be affected by both the technology and the resultant decision, and to jointly derive the required specifications. Later, when the bids come in, they are to be compared according to life-cycle analyses (ENEU 94).

The buyers' group for the technology procurement programme for HF-ballast was composed of industry leading purchasers, whose choice of technology strongly affects other purchasers and actors on the market. In 1991, NUTEK's lighting programme, consisting of buyers' groups and incentive agreements, had reached 30% of the total floor area in commercial premises. This high level of commitment among the property owners and purchasers was achieved through networking, *active and dedicated project management* at NUTEK.

The yearly energy savings by 2010 from the NUTEK's lighting programme are approximately 390 GWh.(Figure 2). The direct effects are those from the incentive agreements. The saving from these are only 8.6 GWh yearly, beginning from 1992. and represent only 2.2% of the total effect over the time span considered. (Lighting installations have a 20-year life span, and are included in Figure 2 under the heading "incentive agreements indirect" as a part of each year's saving distributed over 20 years time.), The most important effects of the incentive agreements and the "Light Corridors " project are however the *four ripple effects* that they have resulted:

- an indirect effect among those involved in the agreements
- a ripple effect (in Figure 2: "Spin-off 1") among those who have heard about the programme requirements and the agreements

- a ripple effect resulting from electrical consultants (in Figure2: "Spin-off 2") who have been in direct contact with the incentive agreement parties or who have themselves been involved in the 'Light Corridors' project. The ripple effect is due to their continuing to recommend new lighting technology while working for other clients
- a ripple effect resulting from electrical installation contractors (in Figure 2: "Spin-off 3") who have been in direct contact with the incentive agreement parties or who have themselves been involved in the 'Light Corridors' project. The ripple effect is due to their continuing to recommend new lighting technology when working for other clients.

The figure 2 shows the various effects both on their own and when aggregated to produce a total effect. The aggregated, the direct, indirect and ripple effects of the incentive agreements amount to an annual electrical saving of 390 GWh over 20 years. This corresponds to a market penetration rate of approximately 40% each year after 1998. (NUTEK 1996; Suvilehto, Alopaeus Sandberg, Nilsson, and Persson 1997).

The total cost for the NUTEK's lighting programme is estimated at SEK 37 M (~US$ 5.3 M) NUTEK's cost per saved kWh is however only SEK 0.008 (~US$ 0.0011). (NUTEK 1996). This price per saved kWh was arrived at by dividing the cost equally for the 20 years over the equipment's lifetime using the fixed annual instalment method, with a 6% interest rate.

Conclusion of the Lighting Programme

The NUTEKs programme for HF-lighting is an example of a successful programme where several separate but coordinated activities have been taken. The programme also succeeded in setting appropriate requirements such as flicker-free and energy-efficient lighting in the procurement processes, to name but two examples. All parts of the programme contribute to the accelerating market penetration, and thereby also to lower cost for each kWh saved.

Ventilation Equipment Market Transformation

Even though the purchasers are the same as for lighting luminaires, the market transformation programme for the ventilation equipment is fairly different from the lighting programme, partly due to the nature of the product. Programme design was more complicated, because instead of being a product that can be placed in most of the buildings or rooms, like luminaires, ventilation is a system connected to the heating and air conditioning in the building. The ventilation market transformation started with the programme requirement on the specific fan power SFP by 1,5 kW/cbm/s.

A technology procurement programme was announced to manufacturers of ventilation equipment in 1994, and it was completed in 1996. However, so far, only two units of the winning model have been sold. The only supporting activities after the procurement have been the *performance requirements*, *targeted information*, participation in *trade exhibitions*, a *computer tool* (BV2 energy balance model) for optimising energy use in an early stage of a project, and a purchasing *guidebook*, ENEU 94. Poor market acceptance can be partly explained by lack of commitment among other actors on the market. The other possible explanation can be that the power class chosen was not very common on the market. It might have been better to make the procurement on a series of power classes. One addition-

al difference from the lighting programme is that there has not been as many supporting programmes, and NUTEK has not taken an active role in the marketing process in general, and particularly in incentive agreements (Lund et al. 1996). It is hoped that ENEU 94, combined with activities like incentive agreements or demonstrations, could help the market acceptance for the ventilation initiative. This is especially desirable because the operating cost is 65% of the life-cycle cost of the system.

Conclusion of the Ventilation Programme

The ventilation programme is an example of a programme where market penetration has not yet been achieved. One mistake was that the technology procurement programme consisted of only one power class. The other reason for poor market acceptance is that there has not been as many supporting market activities.

Example of a Market-Transformation Programme in the Domestic Sector:

Market Transformation in Domestic Heating

The technology procurement in 1993 for small, brine-water heat pumps was started as a market transformation programme for domestic heating. The heat pumps are a fairly well known product in Sweden. Unfortunately, there were some poorly performing pumps in the mid 1980s and these low-quality pumps and peoples' bad experiences with them made the total market for heat pumps collapse. In the beginning of the 1990s there were very few heat pumps for small single family houses with a floor area of 140 sqm, and an electricity need for both heating and hot water in the range of 20 000 kWh.

The NUTEK technology procurement was finished in 1996. It provided an energy-efficient heat pump (efficiency factor 2.8 to 3.8) for a low cost (30% cheaper) for the small power classes. The heating energy savings from the heat pump was at least 8 000 kWh per year. All proposed systems were test-

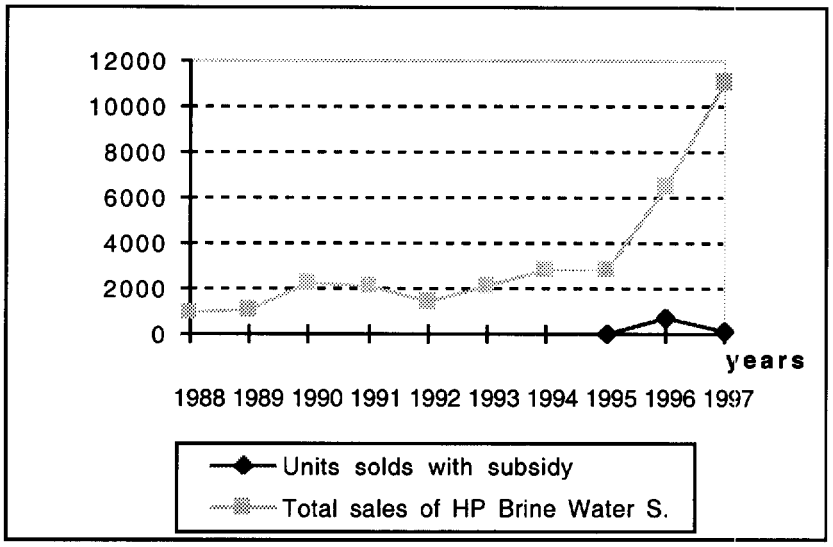

Figure 3. Total Sales of Heat Pumps with Brine Water System and Sales with NUTEK Subsidy

ed and market pricing, as well as pump efficiency, was carefully followed.

Market characterisation: Fifteen manufacturers have a combined market share of approximately 90% of the market for heat pumps in the small power class suitable for single family homes. The other actors in the market are the utilities, heating, water and sanitary consultants, and installation companies. The purchasers are single-family house owners. Approximately 1/3 of all the single-family houses have direct electric heating, and a total of 250 000 houses were built in the 1970s, and should be renovated soon.

NUTEK' s package of activities supporting the market penetration consists of regional and local campaigns involving *targeted informational folders for consumers, positive labelling for identification of products that met the requirements, telephone consumer advice (a consumer hot-line), education, trade exhibitions,* and *subsidies for the first trial batch.* The most essential elements for the improvment in market position have been the highly committed procurement winner and the trade association for heat pumps. The active and committed project leadership at NUTEK and the consumer hot line were also important.

The total sales of the heat pumps with a brine-water system have increased heavily after the NUTEK's technology procurement programme (Figure 3). According to the heat pump manufacturers' trade association, NUTEK's procurement programme restored the credibility of heat pumps in the market and established heat pumps among the options for home owners (Lund et al. 1996).

Conclusion

There are some general conclusions for successful market transformation programmes. First of all, a Procurement is not a R&D project where a possbile failure normally is an accepted outcome of the process since it brings new experience and knowledge. In a procurement process each participant might take a considerable risk, a risk that might be hard to accept for many organisations. Therefore it is vital to plan the process in such a way that risks are minimised. It is important to understand the market, its actors and their needs. We need to know which actors could see the intervention as an incentive and which actors could create market obstacles. The goal is to work with market forces and actors making them committed to the energy-efficient technology and thus reducing government interaction. The government actions, such as technology procurement and the market supporting activities, have to be co-ordinated. Procurement is a starting point not an end to the process. The chances for a successful market transformation increases if the programme consists of several separate but co-ordinated activities. Our experience with market transformation is that the process takes time and all procurements are different. This is exemplified by the three procurement examples, more information on each procurement is available in appendices 1 and 2. The procurements differ due to the nature of the products; some products can be used in many different application whereas some are connected to building system as a whole. The market situation, e.g. number of manufacturers, amount of intervening actors and decision makers varies as well. In order to successfully penetrate a market, it is important that each markets characteristic is known and accounted for in the programme design. Our experience is that it takes long time, from increased awareness to actions undertaking during purchasing, therefore it is important to have persistence in the programme. Therefore, some flexibility is needed so that new activities can be introduced when needed to reach each market actor.

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Appendix 1

Table 1. Technology procurement programmes

Technology procurement programmes	Year of announcement of competition	Year of first delivery	Obligatory requirements for energy efficiency	Competition winner	Improved performance relative to best available	Improved performance relative to average	Improved performance relative to existing	Theoretical potential, TWh
Domestic								
Combination fridge/freezers	1990	1992	1 kWh/litre & year	0,79 kWh/litre & year	28%	32%	61%	1 TWh
Central utility room, washing machines & dryers	1992	1994	1,35 kWh/kg of dry washing	1,2 kWh/kg of dry washing	-	48%	67%	1 TWh
Apartment washing machines & tumble dryers	1994	1996	0,7 kWh/kg of dry washing	0,6 kWh/kg of dry washing	50%	80%	-	
Commercial premises								
HF-lighting	1991	1992	-	-	-	20%	20-30%	1 TWh
Ventilation Unit	1994	1996	SFP 1.5 kW/(m3/s)	SFP 1.5 kW/(m3/s)	-	50%	63%	0,5 TWh
Ventilation filters	1995	1997	-	- -	-	-		
VDUs	1991	-	-	- -	-	-		
Refrigerated displayes	1996	1997	2600 kWh/metre run & year	1745 kWh/metre run & year	50%	65%	-	
Detached houses								
Windows	1991/93	1992/95	1.0 W/m^2,K	1.0 W/m^2,K	17%	44%	-	8 TWh
Heat pumps	1993	1995	Saving of at least 8 000 kWh/year.[1]	8300-9000 kWh.	-	-	30%	3 TWh
Radiator control systems	1994	1996	Savings of at least 1000 kWh/year	All complied.	-	-	10%	0,7 TWh
Water heaters	1996	1997	Max. power loss: 70 W	Max. power loss 58 W	30%	56%	60%	0,3-0,5 TWh
Detached house 2000	1994	1995	Max. consumption: 8 MWh/yr. for heating &domestic electricity.	8 MWh/year	43%	50%	68%	1 TWh
Home lighting	1996/97	1997/98	At least 75 % better[2]	-	-	75%	75%	≈0,7TWh
Traffic								
Traffic lights (LED)	- -	-	8 W	- 87%		-		
Electric cars	1994	1996	0,2 kWh/km & tonne	0,2 kWh/km & tonne	-	-	67%	-
Industrial								
Factory doors	1994	1996	18 000 kWh/year	13 000 kWh/year	-	50%	-	0,2 TWh
Power & energy demand in foundaries	1994	1994	Price effect	Existed -	-	-	-	
Mine fans	1992	1994	-	-	-	-	0,2 TWh	

[1] Note that heat pumps also had a price require-ment. The winning pumps were about 30% cheaper than before the procurement.

[2] The aim with the procurement is to get new Cfl dedicated luminaires to the residential market.

Appendix 2

Table 2. Technology procurements and market activities.

Technology procurements and market activities	Active buyers group	Media	Targeted information material	Labelling	Advice to professionals	Consumer advice by telephone	Exhibition	Education	Volunatry agreements	Active manufacturer	Other active actors	Subsidy for first trial batch	National campaign	Regional / local campaign	Demonstration	Green office	Accelerating market penetration
Domestic																	
Combination fridge/ freezers	X	X	X	X[1]		X	X				X[2]	X	X[3]	X[2,4]			X[5]
Central utility room, washing m. & dryers	X	X	X		X	X	X			X	X[2]	X	X[6]	X[4]			X
Apartment washing machine & tumble dryers	X	X	X	X[1]		X	X				X[2]	X		X[4]			X[7]
Commercial premises																	
HF-lighting	X	X	X		X		X	X	X	X	X[2]	X	X[6]	X[2,4]		X	X
Ventilation Unit	X	X	X		X		X	X	X[12]	X							
Ventilation filters	X	X	X				X	X		X		X					X
VDUs	not used	X	X	X[8]	X					X	X[8]		X[6]			X	X
Refrigerated displayes		X	X		X		X			X	X	X			X		X[7]
Detached houses																	
Windows	X[9]	X	X	X[1]	X	X	X	X		X[6]		X[10]	X[6]	X[4]			
Heat pumps		X	X	X[1]	X	X	X			X	X[2]	X	X[6]	X[4]			X
Radiator control systems		X	X			X	X			X	X[2]	X		X[4]			
Water heaters		X	X			X					X[2]	X		X[4]			
Detached house 2000	not used	X	X			X		X						X[4]			
Home lighting	not used	X	X			X	X						X[3]				
Traffic																	
Traffic lights (LED)	X[11]	X								X					X		
Electric cars	X	X	X				X					X					
Industrial																	
Factory doors		X	X						X			X					
Power & energy demand in foundaries	X	X	X							X	X	X					
Mine fans		X	X												X		

[1] Positive labelling with ELOff Strömsnål for white goods.
[2] Utilities have been active agent on marketing these products
[3] New started in 1998 for home lighting and cold appliances
[4] Värmland
[5] Only 6% in 1996, but the assortment of energy efficient refrigerators is 50%. The price difference is today only 100 SEK.
[6] Rail show, the Environmental Office project went around Sweden and stopped in all larger cities. In each stop there were seminaries and show "rooms" wagons even for other products than office equipment.
[7] Too early to assess
[8] TCO92, TCO95, Energy Star 98
[9] Motivated but very small
[10] Additional subsidy during 1995—97
[11] Cities, such as Stockholm
[12] Voluntary agreements,. included ventilation, but not the procured ventilation unit.

Appendix 2

The aim of this appendix is to give an overall picture of the wide range of activities that have been used in order to achieve an accelerating market penetration for the technology procurement programmes presented in appendix 1. Both the procurements and activities are many, wherefore they are difficult to summarise. In order to make the table more readable we have included this section with instruction on what information is available in the table. The first column has the list of all the technology procurements (TP) as in appendix 1. The first row consists of different type of activities that have been used in the Swedish programme. These activities are explained in below.

The list of activities:

• *Active buyers group.* The driving force in the Swedish programme is the purchasing power, which is represented by the buyers group. This group creates a set of common performance requirements for a given product. There are a few procurements were such a group has not existed, due to the fact that such a group has not been identified or the technology has not implied any incremental cost. A buyer group has not been used for procurement on VDU's, detached house 2000 and for home lighting. Some of the procurements have had a buyers group consisting of intervening actors such as utilities and could therefore not represent the same level of purchasing power.

• *Media*, the technology procurement programmes have been presented in the media mainly through press relases and interviews with the project managers. One powerful and fairly new media to reach several interest groups has been the internet home page. Has been used in all procurements.

• *Targeted information material*; includes brochures, newsletters etc. The material focuses on specific group of decision makers, e.g. single family households.

• *Labelling*, consists of positive labelling. The first label was the El Off Strömsnål which was introduced for white goods before the EU energy label. The target group for El Off is consumers and retailers. Today El Off lists are available for windows and small heat pumps. A list for radiator control systems is underway. The other labelling scheme is for VDU's, this scheme is produced together with the TCO. The label consists of requirements on e.g. visual ergonomics and energy efficiency. The labels are TCO92 and TCO95, which is an update. From 1998 Energy Star requirements meet the NUTEK performance levels.

• *Advice to professionals*, is a set of programme requirements for professional buyers, consultants or for decision makers. These requirements are available for lighting in office, school, hospital, and industrial premises. The requirements are set on visual comfort and energy efficiency. Other similar requirements are available for ventilation.

• *Consumer advice by telephone*, is a service for house owners and households. The main target group has been those living in single family house with electric heating. So far the main emphasis has been on questions for heat pumps, windows, radiator control systems and water heaters.

• *Exhibitions*, trade exhibitions are used for presentation of the procured products for those professionals who are not active. We participate on 5-10 exhibitions per year.

• *Education*, there is a education programme on energy efficient lighting and ventilation for maintenance personnel in local government premises such as schools.

• *Voluntary agreements* , consists of incentive agreements and EKO energy agreements. The incentive agreements contains a subsidy for the incremental cost when purchasers choose more efficient technology. The requirement from NUTEK's part has been that the installation is done according to the programme requirements. The EKO agreements, aims to implement an energy and environ-

mental policy such as EMAS or ISO14000 certification in a manufacturing company. The process starts with contacts on management level, followed by an agreement, energy audits, education on to purchasing according to life cycle analyses (ENEU).

• *Active manufacturer*. The aim of the Swedish programme is to bring energy efficient products with compatible prices in to the market. In all the procurement programmes where the market penetration is accelerating e.g. VDU's, HF-lighting systems and heat pumps the manufacturers are highly committed to the procured products.

• *Other actors on the market*. Other actors representing some interest group in the society help to disseminate information and products to different target groups. Utilities have been an active actor on disseminating information of a wide range of energy efficient products. The office workers labour union has spread information of ergonomics and energy efficiency for lighting and office equipment's such as VDU's. The Swedish Society for Nature Conservation has actively debated the environmental benefits of using energy more wisely.

• *Subsidy* for the first trial batch, covers a part of the incremental cost for choosing the procured product.

• *National campaign*. This activity is new. The first national campaign was for homelighting in February 1998. The next campaign will be for white goods. The campaigns include television advertisement, information leaflets, and placards. Both of the campaigns will be repeated twice a year.

• *Regional / local campaign*. Värmland is a test project for regional campaigns in Sweden. The goal is to see benefits of more concentrated programme with higher local commitment. So far the experiences are positive. The white goods and the El Off labelling scheme have been an issue for local recycling campaigns. The sales of energy efficient white goods has increased by 30% in each of the campaigns.

• *Demonstration*, this activity has not been used widely. It has mainly been used when the technology has either been very new or specific to one application.

• *Environmental Office*. Offices are a very common working place today. The energy use in these premises has increased rapidly due to increasing number of office equipment's, climate cooling etc. The environmental office project focuses on how to reduce the environmental impacts of the office premises with even better ergonomics. The aim is to inform people so that they can require and implement an over all environmental policy in their working place. The issues that are raised are transports, equipment's and consumption goods. More over the focus is on purchasing policies. The purchasers are provided with information on how to reduce the environmental impacts of energy use and which material or production processes contain environmentally hazardous waste. This project is run jointly with the TCO, office workers labour union and The Swedish Society for Nature Conservation.

• *Accelerating market penetration* is our judgement of the ongoing market penetration process. For some of the procurements the market penetration rate can be seen in sales data, changes in market shares and prices. For some of the procurements we have based our judgement on market conditions, evaluations and indications from the trade associations.