

## **Internationally Coordinated Procurement of Innovative Copiers**

### **Project Management October 1995 – September 1997**

(Slightly updated translation of the final report addressed to the Swiss Sponsors:  
Federal Office of Energy and Electricity Utility of the City of Zurich)

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## Summary

Although Switzerland is not officially taking part in Annex III "Co-operative Procurement of Innovative Technologies" of the DSM Agreement of the International Energy Agency (IEA), the manager of the project "Copiers" from October 1995 to September 1997 was the Swiss author (B. Aebischer). Half the project management costs were financed by the IEA and the other half by Swiss institutions. Swiss backers were the Electricity Utility of the City of Zürich and the Federal Office of Energy (through the Competence Centre "Energy and Information Technology" and through a direct contribution from the Services Section of Energy 2000). The author manages the Competence Centre mentioned above. Its special contribution to the project has been to encourage large purchasers to become more involved in implementing measures to promote rational energy use of office equipment. This report will also discuss the central aim of Annex III, namely to develop and test the new instrument "Technology Procurement" in promoting efficient use of energy.

When large plants are purchased for industry, military equipment for the army or vehicles and aeroplanes for large transport firms, it is usual for the potential buyers to describe their requirements and invite tenders for the product in order to find one that meets their needs. This process is described in Anglo-Saxon countries as "Technology Procurement". It has been used with considerable success for some years now, particularly in Northern Europe and the USA, in developing energy-efficient and environmentally friendly consumer goods and launching them on the market. In order to reduce the risk for manufacturers of developing and marketing such a product, purchasers with similar goals together draw-up a requirement list for the future product and commit themselves to purchasing the first batch. Within the framework of the IEA, Annex III "Co-operative Procurement of Innovative Technologies" has proposed a procedure for the international coordination of innovative technology purchasing. This will allow purchasers to influence the production of products for the international and global market. The intention is to demonstrate the feasibility of the proposal through case studies of concrete purchasing programs, such as an energy-efficient tumbler-drier, a 40% more efficient light bulb, and a more energy-efficient and environmentally friendly photocopier.

For the Copier Project, the author proposed developing medium-speed photocopiers with a very low standby consumption and a very short warm-up time as the primary goal, although there are a variety of other improvements in energy efficiency that might be possible. This proposal was accepted by the participating countries. In order to make the innovative copier more attractive, the öbu (Swiss Association for Environmentally Aware Company Management) working group on copiers initiated by the author extended the requirements to other economic and environmental areas. Various purchasers, manufacturers or importers, and institutions and organisations were consulted on this. Their main concern turned out to be reducing paper consumption.

As it appeared unrealistic to involve purchasers in committing themselves to buying a product that did not yet exist, the idea of "Leading Buyers" and "Supporters" was developed. Leading Buyers commit themselves publicly to consider the innovative copier in future purchasing evaluations and to undertake steps within the organisation to ensure that environmental aspects are included as purchasing criteria. A useful, standardised declaration leaflet giving relevant data about energy consumption and environmental factors drawn up by the öbu working group should enable purchasers to compare products on the market more easily. Supporters commit themselves to finding other purchasers prepared to follow this procedure. Four Swiss firms (two banks: Credit Suisse, the Swiss Bank Corporation, one large retailer: Migros-Genossenschafts-Bund, and one insurance company: Swiss Reinsurance Company) were the first to agree to act as Leading Buyers. öbu and the Services Section of Energy 2000 acted as Supporters. It is expected that a similar level of support will be organised in the six countries (Finland, Great Britain, Korea, the Netherlands, Sweden and the USA) that are officially involved in the Copier Project before the end of 1998.

The copier manufacturers were informed about the project in an announcement in the official EU information bulletin in summer 1996. Selected manufacturers were consulted about technical questions, market strategies and the significance of Market-Pull activities. A long-planned conference involving the whole copier industry took place on 2nd December, 1997.

It became increasingly difficult to finance the management of the project from Annex III's "Cost Sharing Fund" and contributions from various Swiss sponsors, so it was essential to find other ways of guaranteeing the long-term financing of the project including additional expenses (producing documentation, PR work, legal and technical expertise, organising conferences, secretariat, etc.). After lengthy negotiations about the continuation of the project, the author's proposal to take up the USA's offer was accepted by Annex III's experts. The management of the project has been in the hands of the American EPA (Environmental Protection Agency) since 1997. The existing form of the project was adopted and the activities already initiated have been continued. How the activities in Switzerland will be pursued remains open, but all agree that they should be continued in some form.

# **1. Project Programme**

## **1.1 The General Project "Co-operative Procurement of Innovative Technologies"**

Annex III of the DSM-Agreement of the International Energy Agency (IEA) is currently supported by 6 European countries (Denmark, Finland, Great Britain, the Netherlands, Spain, Sweden), by the USA and, as of mid 1997, by Korea. The European Union is participating financially and the World Bank has observer status.

The objectives of Annex III are:

- to develop a procedure for internationally co-ordinated procurement; and
- to demonstrate its feasibility in practice through selected examples.

The conceptual work for the overall project is carried out by the "Operating Agent", the representatives of participating countries and the managers of the different sub-projects. This "expert group" meets to discuss the sub-projects and to decide on further action two or three times a year.

The results of this preparatory work are documented in the study "Co-operative Procurement. Market Acceptance for Innovative Energy-Efficient Technologies" [Wes 1996]. In what follows, the most important stages in a procurement project are described:

- preparation
- publicity
- development
- market acceptance

The official sub-projects in Annex III deal with the procurement of the following technologies and equipment:

- 40% more efficient light bulbs with a lifetime of 3000 hours
- energy-efficient tumbler-driers (probably using heat pump technology)
- photocopiers with a very low standby consumption and a very short warm-up time
- vending machines with energy savings of 30% (hot drinks) and 60 % (cold drinks)
- energy-efficient television sets

In addition to these five projects, Annex III also supports the procurement of LED traffic lights and of energy-efficient induction motors. This last project was instigated by Finland.

Most of these projects aim either to organise the market promotion of those technologies already available in the form of prototypes (tumbler-driers, light bulbs, motors) or to improve existing appliances by using traditional methods (vending machines, television sets). The required level of performance for the innovative copier, on the other hand, has not yet been reached in practice.

## 1.2 Preliminaries

After the author officially took over the management of the Copier Project in October 1995, preparatory work concerning the strategic orientation of the procurement was undertaken. Given the various possibilities, different ways of potentially saving energy and cost were evaluated and further advantages for potential buyers explored. Special attention was paid to how the project could contribute to demonstrating the feasibility of co-ordinating procurement internationally. Details are to be found in the conference contribution "Co-operative Procurement of Innovative Copiers" [Aeb 1996: 4-7].

In the evaluation, the energy policy priorities of the different countries had to be considered. Some countries favoured a coherent approach based on existing programmes (e.g.. labelling and support programmes), while others were prepared to test a new energy policy instrument without expecting immediate benefits. The first group preferred strategies based primarily on criteria such as cost efficiency or the extent of cost savings, whereas the second group was more concerned with promoting co-ordinated procurement. The first group was in favour of a procurement strategy to promote more efficient use of present-day technologies and wanted, therefore, to promote the use of existing labels (Energy Star and Energy 2000). The second group believed that only by implementing a new fuser-technology which ensures a very short warm-up period could automatic power management be made generally acceptable. Furthermore, there was a lack of agreement about whether the focus should be on saving electricity or on saving paper.

Towards the end of the year 1995 the author proposed that the procurement project should concentrate on promoting a copier with a very low standby consumption and a very short warm-up time. The most important arguments in favour of this proposal were:

- 1 What hampers the market-acceptance of most energy-efficient technologies in office equipment is the higher initial cost or even life-cycle cost. Fast copiers face an additional problem: they lack a demonstrated technical solution that does not entail unacceptable losses of performance, i.e. long waiting time to get the machine ready for the next copy. The large energy-saving potential in the standby mode can in practice only be exploited by means of a new fuser technology with almost no recovery time.
- 2 Fuser technology is a "cross-cutting" technology which can be used in all types of copiers, e.g. full colour copiers, digital copiers and multifunctional equipment. The development of a new energy-efficient fuser is therefore compatible with any of these strategic directions of development.
- 3 The improvement of faster copiers is not an utopian idea. One of several proposed technical solutions was implemented in slow copiers and successfully marketed by Canon a few years ago. The innovation here, then, just involves a transfer from one market segment to another. It is not a completely new invention. This leads us to believe that it will also be possible to develop a technical solution in faster copiers within two to three years.

- 4 Further criteria, in particular environmental aspects, can easily be taken into account when developing the innovative copier.

The proposal was accepted by the representatives of the countries. Four countries decided to support the project officially: Finland, Great Britain, The Netherlands and Sweden. At the time the USA could only offer informal active assistance due to budget restrictions.

It was decided, however, to have an independent expert assess the feasibility of the innovation and Dr. Peter Jeanmaire was appointed to do this. The first part of the feasibility study was completed in spring 1996 and was followed by extensive patent research in May 1996 [Jea 1996]. Jeanmaire coined the term ZESM-copier (Zero Energy Standby Mode) to describe the energy-efficient "instanton" (instantly ready) copier.

Jeanmaire found that a number of copier manufacturers had patents pending for various technical developments which could, in theory, meet the requirements for an innovative copier. This is very promising because:

- 1 The fact that several manufacturers are interested means that there is competition. This is necessary for legal reasons and has economic advantages.
- 2 The existence of alternative technical solutions increases the probability that at least one patent will provide a feasible way of developing faster "instanton" copiers.

The preparatory work also involved the drafting of the Challenge Brochure [Cha 1996], which is now available on the Internet (<http://www.stem.se/IEAprocure/copiers/copiers.html>). Distributing this information leaflet enables a larger public to find out about co-ordinated procurement of innovative technologies and may arouse the interest of potential purchasers and suppliers.

### **1.3 Public Announcement of the Procurement**

The "Operating Agent" found out that, for legal reasons, in particular due to the administrative regulations of the EU, it was necessary to announce publicly the intended procurement in the official EU bulletin before establishing contacts with potential suppliers. This took place on July 31st, 1996 [Sup 1996].

### **1.4 Contacts with Manufacturers/Suppliers of Photocopiers**

On September 11th, 1996, an informal meeting with selected copier manufacturers took place in Stockholm. The manufacturers invited to the meeting had been chosen on the basis of Jeanmaire's study. Five manufacturers were invited and three Japanese companies (Canon, Matsushita and Ricoh) and one American company, Xerox, attended the meeting. The objectives were twofold: to discuss Jeanmaire's feasibility study and to explain the intended procurement of ZESM copiers. The manufacturers confirmed that it was feasible to produce a fast ZESM copier. As expected, they were not prepared to provide details about possible solutions to the remaining technical problems or about their marketing plans. They appeared, in particular, to favour the development

and marketing of full colour copiers and multifunctional equipment. The general opinion was that the requirements of even the smaller buyers can play a decisive role in influencing manufacturers' strategic decisions.

All the companies said they wished to participate again at future meetings. The general interest of manufacturers was also apparent in the disappointed reactions of several manufacturers who had not been invited and wanted to know why. They expressed an interest in participating at similar meetings in the future.

The öbu working group on copiers, which is described in the next section, includes several Swiss representatives of copier manufacturers. In some cases they have close ties with their parent companies, which helps to ensure a good information flow.

Informal contacts with individual manufacturers were cultivated by the project manager and by P. Jeanmaire throughout this period. In the late summer of 1997 the author visited selected manufacturers in Japan.

### **1.5 Involvement of Consumers**

How successful the procurement of innovative technologies is depends on the pressure from consumers felt by manufacturers. In the case of a mass product destined for the world market, a significant Market-Pull is, of course, more difficult to create than in the more traditional case where a single buyer, e.g. an airline company or an army, negotiates with several potential manufacturers. This project also differs from more typical procurement projects in that energy-related and environmental criteria usually play only a minor role in influencing procurement decisions. In addition, "Imaging Technologies" are at the moment going through a phase of very dynamic development as some of the latest "buzzwords" show: full colour copiers, networking, digital copiers, multifunctional machines, electronic transmission and storing of information. Consumers are likely to notice these developments and, of course, the corresponding prices without committing themselves at this stage to one particular model. At the same time, they can potentially influence manufacturers by pointing out that, among other criteria, they are also concerned about energy consumption. This means that manufacturers will have to consider the ZESM aspect in developing further copiers.

The first goal in involving consumer groups is, therefore, to persuade various potential buyers to take into consideration energy-saving and environmental criteria when deciding what to buy. They can then influence manufacturers to pay attention to these aspects when making strategic decisions by giving them small, but clear, signals, e.g. by declaring their interest in saving energy and by taking appropriate steps. One such step could be getting potential consumers involved in elaborating a catalogue of requirements for the innovative copier and getting their support in public discussions with manufacturers. At the company level, such activities can be put forth as a leading example of a company-wide environmental strategy.

Initial discussions with potentially interested companies have shown that they are more open at this level to considering the broader environmental aspects than to focusing only on saving energy. A key issue is the consumption of paper, which is environmentally very important and which also affects cost. The idea of invoicing per sheet of paper rather than per copy (as is customary nowadays) seems to be particularly attractive.

In Autumn 1996, an International Study Group for Copiers was formed with the aim to organise national groups of buyers in each participating nation (Finland, Great Britain, The Netherlands, Sweden) to actively support the procurement project. As a counterpart to this, Switzerland has also set up a copier study group within the framework of the öbu, which is meant to play an exemplary role for the international group and also to carry out preliminary practical work, such as drafting a catalogue of requirements for the innovative copier. Between Winter 1996 and Summer 1997, the öbu study group held four meetings with 12 as the average number of participants. The following groups participated:

- 2 - 5 potential buyers (insurance companies, banks, retailers, universities)
- 2 institutions (Energy 2000, Energy Agency of the Canton of Zurich)
- 2 - 4 representatives of manufacturers and distributors of copiers
- 2 - 4 experts on either copiers and/or paper

As a starting point, the öbu group decided to compile a declaration sheet to provide data about the energy-consumption and environmental impact of copiers in use now. This data sheet [öbu 1997] complements and is similar to existing forms for PCs, monitors and printers, which were compiled by a group with representatives from Canton Zurich, SWICO and ICMF in 1995/6. The Federal Office of Energy intends to use these declaration sheets to obtain input for a data bank which will provide useful information for potential buyers of office equipment. The declaration sheet for copiers is included in Appendix 1.

On the basis of this declaration sheet, a catalogue of requirements for the innovative copier [öbu 1997/2] was drawn up, which was used as input for discussions in the international study group (Appendix 2).

Four participants in the öbu copier working group have agreed to act as "Leading Buyers":

- Credit Suisse
- Migros Genossenschafts-Bund
- Swiss Bank Corporation
- Swiss Reinsurance Company

A Leading Buyer can support the Copier Project actively through, for example, its involvement in drawing up the catalogue of requirements, through its public commitment to consider the purchasing of the innovative copier as soon as it comes on the market, and through its support of the innovative Copier Project as part of company policy. In particular, any evaluation of future

copier purchases should take into consideration not just the usual criteria of price, service, etc., but also the requirements for an innovative copier given in the catalogue.

The programme "Energy 2000", represented by its Services Section, and the öbu itself are supporters of the Copier Project. It is not yet certain whether all Zürich's Cantonal Authorities will support the project, but the "Energy Section" is committed to the project. Supporters are expected to help stimulate interest in the innovative copier among colleagues in their field or among their members, and to use, as far as possible, their own initiative to strengthen this interest.

The activities of the copier groups in other countries are taking their time to produce results. At a meeting of the International Study Group for Copiers in Zürich in June 1997, only Great Britain was able to show that useful contacts with buyers had been made. Since then, Novem (the semi-private Energy Agency in the Netherlands) has, within the scope of Holland's state voluntary pledge programme, organised an information and promotion event about the innovative copiers. In the USA, a large chain of copy-shops and the US Postal Service are interested in the ZESM copier.

## **1.6 Public Relations**

Public relations work is needed for two main reasons: first, to advertise the project so as to encourage firms and organisations to participate in it actively; and second, to make the notion of "Technology Procurement" as a new energy policy instrument known to a wider public. It should, then, be possible to "synergise" with existing programmes and activities and thus improve the chances of the Copier Project being accepted.

The Copier Project was presented for the first time outside the IEA in July 1996 at the UNEP Conference entitled "Implementing Environmental Commitment in the Insurance Industry" in London. The workshop was organised by the Swiss Reinsurance Company. It successfully achieved its aim of gaining the interest of some potential initial buyers (so-called "Leading Buyers") for the project. Three companies are already participating in the öbu study group. Other insurance companies have also shown an interest in collaborating with national study groups.

The project was presented to a larger audience for the first time at a conference entitled "Optimising Energy Efficiency in Office Equipment & Consumer Electronics", which took place in Stockholm in September 1996 [Aeb 1996].

An article in the German journal "Papier & Umwelt" (Paper and Environment) pointed out the possibility of reducing CO<sub>2</sub> emissions by using ZESM copiers [Aeb 1997].

The project was presented for the first time in America by Jeffrey Harris at the Energy Star Forum in Spring 1997 [Har 1997].

In Summer 1997, the author gave a presentation [Aeb 1997/2] at the Summer Study Conference of the ECEEE (European Council for an Energy-Efficient Economy) in the Czech Republic to an audience consisting mainly of scientists and politicians.

### **1.7 Future Action Planned**

The future course of action essentially depends on the success of the activities of the international study group and the results of the first meeting of buyers and manufacturers in December 1997 in Washington. Westling's outline of a possible course of action for procuring innovative technologies is given as a guideline for how this project may proceed [Wes 1997]:

- call for tenders
- evaluation of offers
- conclusion of contract
- development, prototype
- market implementation
- stimulation of market acceptance

As already mentioned in section 1.5, the sales conditions for the innovative copier cannot be compared to the classical form of procurement in which typically one buyer makes a legally binding commitment to purchasing a product which has not yet been developed. It will be, therefore, crucial for the Copier Project to find a form of involvement of buyers which is sufficiently attractive for manufacturers to want to develop and market the innovative copier as a product even though no purchase guarantee can be given. Annex III's other two procurement projects, which are already more advanced, face the same problem. The energy-efficient tumbler-drier project is likely to have the support and financial backing of important electricity companies and national energy agencies. In the efficient light bulbs project, negotiations are already taking place with large-scale buyers and distributors. As far as the Copier Project is concerned, governments setting long-term target values for the energy-consumption in standby mode could, among other measures, be a promising sign.

The knowledge and experience gained during the Copier Project will be considered in the overall evaluation of the more comprehensive project "Co-operative Procurement of Innovative Technologies". To this end, a two-stage procedure involving two meetings is planned. The first will be an internal meeting within Annex III (early 1999) and the second will be a public event (late 1999 or in the year 2000).

At the moment it is still not possible to predict whether it will be possible to launch the innovative technologies on the market by the end of 1999. The time needed to develop the technology and for the manufacturers to make strategic decisions is difficult to predict, and there may be delays due to unforeseen factors that could set the planning back months. Therefore, the possibility of

extending Annex III for one year until the end of 1999 is currently being discussed in the framework of the DSM-Agreement of the IEA and what this would involve is being explored.

### **1.8 US Take-over of the Project Management**

Within Annex III, the management of a pilot project is normally done by a "Leading Country", which then provides a project manager, funds the administration of the project and covers its various expenses. With the Copier Project, however, there was no Leading Country. The USA, which was originally interested in having this role, had to withdraw its candidature due to budget restrictions. Other interested countries were either already involved in other projects as Leading Countries or did not have the necessary qualifications. As mentioned at the beginning, Switzerland did not officially take part in Annex III and the author's involvement did not mean that Switzerland was obliged to provide any kind of financial support. Various sponsors in Switzerland did, in the end, cover half of the project's administrative costs over two years, while the other half was paid for out of Annex III's cost-sharing fund. It was not easy to raise this money, and the forecast that a continuation of the project would lead to considerably higher costs meant that it was necessary to fundamentally rethink the financing of the project and to ensure longer in advance that the money would be available. Finding a Leading Country to run the project was the logical solution. Fortunately, the financial upturn in the USA meant that it could be considered as a candidate again. After lengthy negotiations about how the project should be continued, the author suggested taking up the USA's proposal for continuing the project and this was accepted by Annex III's experts. Management of the project has been in the hands of the US EPA (Environmental Protection Agency) since October 1997. It was taken over in its existing form and the activities already initiated are being continued.

## 2 Results

### 2.1 From the Point of View of the Project Manager

The stage the Project had reached in Autumn 1997 is shown in Figure 1. The Project's original timetable has had to be extended by at least a year. The main problem was that the time needed to organise potential purchasers was underestimated, and so was that necessary for the manufacturers to decide on a product, and then develop and market it. Similar miscalculations were made in the other pilot projects. The Executive Committee of the DSM Agreement, therefore, applied for at least one year's extension for Annex III, and this has, in the meantime, been granted. With the USA as a Leading Country and the management of the Project in the hands of the EPA, the long-term financing of the Project is guaranteed.

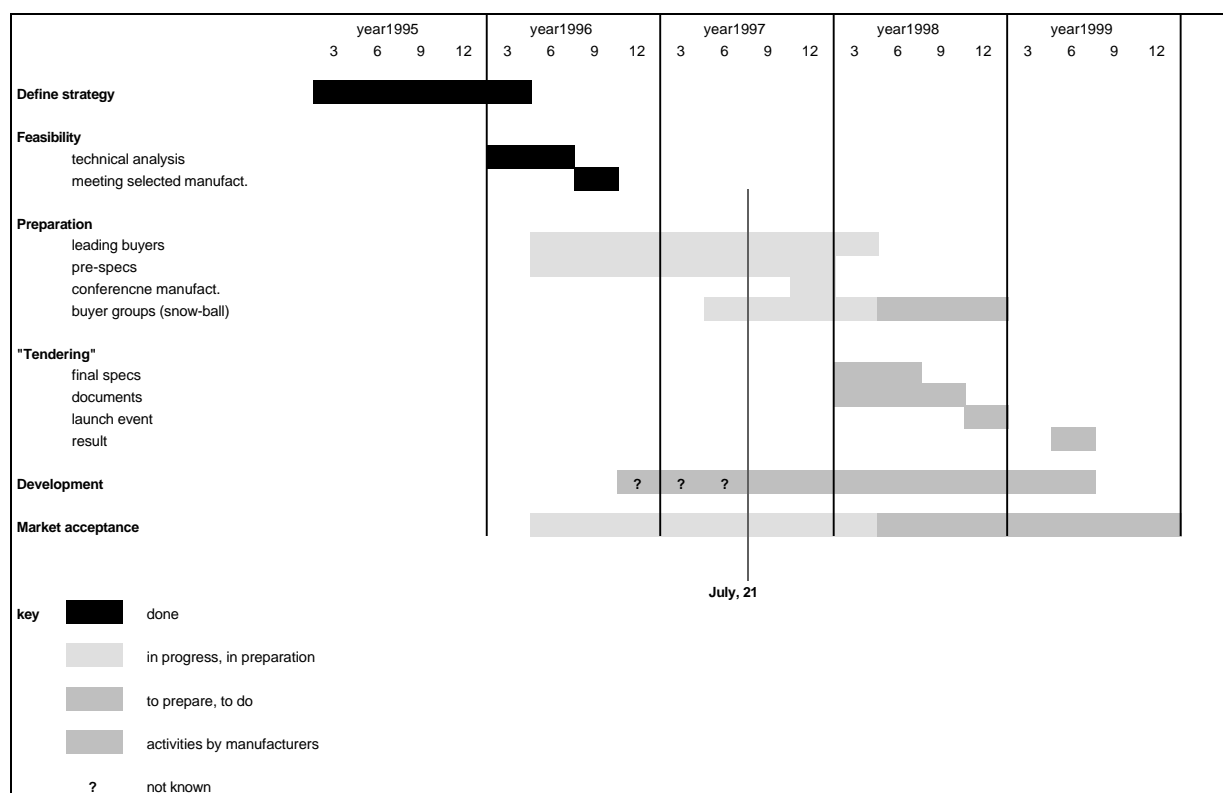


Fig. 1: State of the Project and Planning in Autumn 1997

The first two steps have been completed, namely: strategic orientation and feasibility study. The most important arguments for focusing on reducing energy consumption in standby mode (ZESM copier) have been given in section 1.2. This choice of focus has further advantages: it is easy to communicate its potential advantage to the user and an existing measurement procedure can be used.

Also well-advanced is the preparatory phase where the existence of a market demand for such an innovative copier has to be convincingly demonstrated to the manufacturers. In order to stimulate the interest of purchasers, it was necessary to consider other environmental aspects. In particular,

there is a demand for attractive double-sided copying. Reducing paper consumption clearly has greater economic and environmental advantages than reducing the direct energy consumption. The idea of having Leading Buyers and Supporters has been widely accepted as the best possible demonstration of a Market Pull.

The aims of the Copier Project are not restricted to just launching the innovative copier on the market, but also include, in the long-term, ensuring that these energy-efficient and environmentally friendly machines capture a significant share of the market (achieving "market acceptance"). This is where the various local, national and international initiatives to foster a rational use of energy and to reduce the strain on the environment come together. Achieving these ends means considering energy and environmental aspects as criteria in evaluating products. The prerequisite for this is to have the relevant data made available in an attractive form. The declaration leaflet giving relevant data about energy consumption and environmental factors drawn up by the öbu working group is a step in this direction.

The following summary provides an overview of the preliminary results from the point of view of the Project manager:

- A scheme accepted by experts from the IEA and from international copier groups has been developed. It is based on three "pillars":
  - focus on a cross-cutting technology that is compatible with development trends;
  - initiating market demand through Leading Buyers and Supporters, who benefit by gaining a distinctive image internationally;
  - operationalising the Market Pull by applying purchasing criteria concerning energy and the environment.
- Seven countries are working together in the international copier group.
- In Switzerland the öbu working group on copiers was set up and held four meetings between November 1996 and April 1997.
- Four prominent Swiss firms agreed to act as Leading Buyers, and the öbu and the Services Section of the Energy 2000 programme agreed to act as Supporters.
- The öbu working group on copiers drew up a declaration leaflet giving relevant data about energy consumption and environmental factors for current copiers. The Federal Office of Energy has promised to encourage the use of this form. It can be viewed at the following website: <http://www.admin.ch/bew/d/index.htm>.
- The öbu working group prepared a first draft of the requirements for the innovative copiers which were discussed on 2nd December 1997 in Washington DC with the manufacturers.
- Information material was conceived and developed. In part this is already available in the form of brochures and at the website of the Swedish NUTEK (<http://www.stem.se/IEAprocure/copiers/copiers.html>), and in part it is currently being revised by the American EPA.

- The most important manufacturers in Japan and the USA were involved in the preparatory work at an early stage and their Swiss representatives are active members of the öbu working group on copiers. All the important manufacturers attended the meeting in Washington.

## 2.2 From the Point of View of the Group of Experts for Annex III of the IEA-DSM Agreement

Besides the Copier Project, Annex III has two other pilot projects running. One concerns the procurement of a light bulb with 40% higher light yield, and the other a tumbler-drier which saves roughly the same amount of energy. In the first case the aim is to launch the product on the market by involving large retail wholesalers. In the second case, electricity companies and state institutions will support the marketing of the product by providing consumer subsidies. These and other differences between the three projects are summarised in Figure 2. The Copier Project complements the others in significant ways as it appeals to a completely new type of consumer with different purchasing patterns. The end user is addressed directly; no subsidies are available. The market for photocopiers is global and consumers in Europe, the Americas and Asia are represented in the project by four European countries, the USA and Korea, respectively. Although Japanese firms are dominant among the producers of copiers, the USA with one very important manufacturer and Europe with several relatively important product brands and a certain strategic autonomy also play a role.

|                        |                  |                      |                           |
|------------------------|------------------|----------------------|---------------------------|
| Project:               | tumbler-drier... | light bulb.....      | copier.....               |
| Technology:            | known.....       | other market segm.   | other m. s., patents      |
| Market barriers:       | price.....       | demand, CFL.....     | demand .....              |
| Target consumer group: | households.....  | househ.,institutions | companies, institut.      |
| Manufacturers:         | Europe.....      | Europe, Asia.....    | Global.....               |
| Market:                | Europe.....      | Europe.....          | Global.....               |
| Market introduction:   | subsidies.....   | retailers.....       | consumers.....            |
| Marker acceptance:     | price, environm. | life cycle cost..... | life cycle cost, environ. |

Figure 2: A comparison of Annex III's three pilot projects

Since the copier market is global, the potential effects of the Copier Project are great. If, as a result of our activities, the innovative copier could appear two years earlier on the market, between 100 and 1000 GWh/a of energy would be saved annually each year for 15 years and CO<sub>2</sub> emissions would be reduced by 0.8 to 8 million tonnes of CO<sub>2</sub> per year.

## **2.3 From the Point of View of the Swiss Sponsors**

The seminar with experts from Annex III and representatives of Swiss government institutions and private enterprises that took place in Spring 1995 under the motto "Market-Pull Activities in Switzerland" [Bac 1995] showed that market-pull activities in Switzerland had similar aims and made similar assumptions to those in Sweden and other countries. It also showed that there were distinct methodological differences. It was apparent that coordinated procurement was one approach that could be successfully employed on some occasions to accelerate the market launch of a new product. For sustainable market change, however, further measures, such as labelling, would be necessary. By taking responsibility for the Project, it has been possible to convey this understanding to the international expert group without Switzerland being officially involved in Annex III, and to gain initial experience in planning an internationally coordinated procurement programme. This will allow us to evaluate the possibilities and limitations of such an action in the future. It has been possible to take account of Swiss interests in the Copier Project and thus to reinforce Switzerland's leading position in the area of energy-saving office equipment. In particular, the direct contacts made with important manufacturers and the cooperation established with the American EPA (Environmental Protection Agency) are likely to prove useful in the future. The insights into the work of the other procurement projects can, in part, already be drawn on today. For example, results from research on drink vending machines can be directly fed into the ongoing study of "Energy Consumption and Energy Saving in Vending Machines" [Aeb 1998].

A large part of the work involved in "market preparation" for the innovative photocopier has been carried out in Switzerland. Thus, the öbu study group "copiers" was formed at the initiative of the author. This group is worth attention because it is made up of consumers, manufacturers and institutions, i.e. the most important players in the market are represented. Further, and more importantly, the fact that the group has come together as part of the activities of the öbu means that 250 of the largest firms in Switzerland can, potentially, be reached.

Under the auspices of the öbu study group, a declaration leaflet containing relevant energy and environmental data about copiers was drawn up. This reawakened interest in earlier attempts at something similar with PCs, monitors and printers. The Federal Office for Energy intends, with the help of the manufacturers, to make these data available for consumers in a more attractive and sensible form.

### **3 Outlook**

There are three ways in which it may be possible to continue the present activities:

- by evaluating research and projects on the procurement of innovative technologies;
- by transferring the resulting experience to the Swiss context; and
- by studying the interaction of innovations, "Market Transformations" and procurement.

In the short term, the Energy Analysis Research Group at ETH is ensuring that the contact between Annex III and the Swiss copier group continues. It will also take an active part in Annex III's Workshop "What have we learned?" due to take place in Great Britain in early 1999. In order to set up more long-term commitments, initial contacts with interested parties at home and abroad are planned.

#### **3.1 Evaluation of Research and Projects on the Procurement of Innovative Technologies**

It is not yet possible to say on the basis of what we have learned so far whether the pilot project will be successful or not. Whatever the outcome, it will be necessary to analyse the factors responsible for the success or failure carefully in order to be able to draw conclusions for other practical applications.

Evaluations in the field of "Technology Procurement" performed to date have, of necessity, been restricted to national activities in Sweden and the USA. They have shown that it is possible to measure the effects of such projects, but also that it is necessary to prepare the evaluation early enough and to allow a sufficiently long observation period. In practice, it seems that a qualitative comparison of different projects is more valuable than a quantitative analysis of results. Such a comparative evaluation could be based on a process analysis with the following main themes:

- selection of the technology
- organisation of the consumers
- incentives for the manufacturers
- use of complementary political instruments

#### **3.2 Transfer of Experience to the Swiss Context**

Switzerland has played a leading role in the area of innovative technology procurement since H.J. Leibundgut founded the Association for the Promotion of Improved Energy Use (Verein zur Förderung der Verbesserten Energienutzung, VVE) several years ago and since the VE Foundation (VE-Stiftung [Lei, 1988]) was established. Environmental procurement has gained in importance in Switzerland as a policy instrument used in energy and environmental programmes – see, for example, the recently published strategy paper of the Executive Federal Council on sustainable development in Switzerland [Bun 1997]. Up until now, the strategy of procuring innovative technologies in order to accelerate the development and marketing of new

technologies has not been explicitly considered. More attention would be paid to the "procurement instrument" in discussions of energy and environmental policies in Switzerland if a critical analysis of whether and in which areas a transfer of know-how from abroad would be possible and useful were available. In particular, it would make sense for Switzerland to participate actively in internationally coordinated procurement projects because:

- 1 industrial managers have long been calling for a harmonisation of national initiatives and these calls are growing louder; and
- 2 otherwise Switzerland will probably lose its position as a test market in areas where production and the market are increasingly global.

### **3.3 Interaction of Innovations, "Market Transformations" and Procurement**

The development and marketing of new technologies is the principal goal of "Technology Procurement". It cannot be expected that this will lead automatically to achieving the higher goal of realising the sustainable transformation of the market. The long-term success of a new product line on the market ("market acceptance") can, however, be furthered by introducing additional energy-policy measures, such as: providing information, labelling, and target values. Improving our understanding of the mutual interactions of these different instruments, for example, on the basis of an analysis of case studies that takes into consideration innovation theory in the area of energy will contribute to the development of more effective energy policy measures.

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