

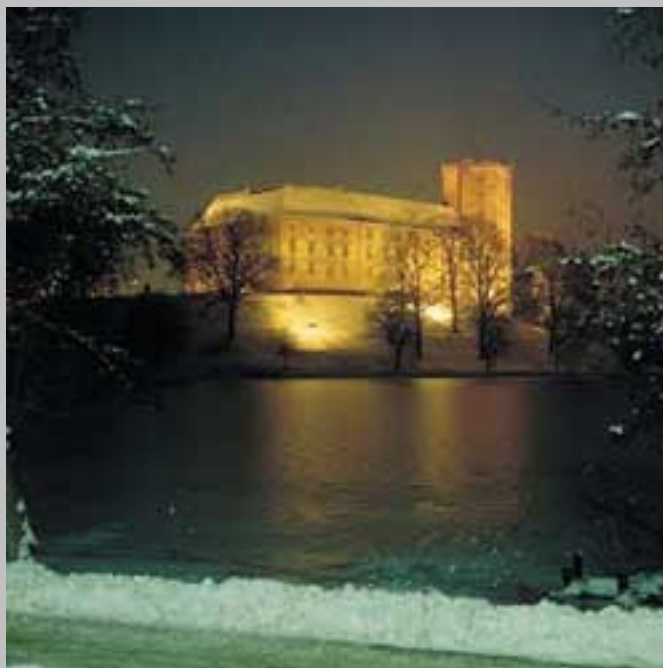
**Kolding
Kommune**

Relief Project

Green Purchasing Status Report

Municipality of Kolding

February 2002



The Castle "Koldinghus" a winter night

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*The Mill; "Gøhlmanns Mølle"
reconstructed in a job creation programme*

Foreword

Green purchasing is one of the ways that public administrations can reduce the environmental impacts from municipal activities. Green products pollute less than conventional products, and public demand is a strong incitement for producers to design and market products with better environmental properties.

In Kolding, all public purchasers use the framework agreements made by the Department of Logistics when there is a need for a product. When selecting the supplier for the framework agreements, environmental aspects are considered on par with price, quality, etc., and the purchasers thus have a very good background for choosing a green product.

The report describes some financial aspects of green purchasing, but the main focus is on the environmental considerations that are specified by the Environmental Department in Kolding. The considerations

are the main fundamental step in the development of a sustainable environment in Kolding as well as in other parts of the world, but the full possibilities are exploited only when all public servants remember to take the environment into consideration in their daily work.

The RELIEF project

The RELIEF project is a co-operation between six European cities and a consortium of research partners from five countries, supported by the EC-DG Research.

RELIEF will develop an extensive set of data on the environmental benefits that are potentially achievable through green purchasing. For this purpose, methods will be developed on environmental assessment of products, assessment of public buying power and evaluation of market conditions. Based on local case studies and priority identification, scenarios will be developed for the application of green purchasing at the European level and their environmental effects will be calculated. The results of this will be combined with a research on innovation, fostering contractual arrangements and a legal analysis.

The present report gives an overview of green purchasing in Kolding and will together with similar reports from the other participating cities form the basis for many of the developments in the other parts of the project that is to conclude in autumn, 2003.

The authors

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Executive summary

The Green Purchasing Status Report for Kolding describes the general procurement structure in Kolding, with an emphasis on how environmental aspects are integrated in the decision on which supplier to use and which products to choose. The report also gives some of the facts and figures for the achievements in green purchasing that have been reached since 1998. Finally, it contains a number of examples of the environmental criteria used in the tendering processes that are fundamental to public procurement in Kolding.

The facts and figures show that within just a few years it has been possible to include environmental aspects in 70% of the framework agreements. The framework agreements cover commonly used products groups like food, office materials, cleaning agents, IT-equipment, etc. but also more special products like toys, diabetes products and cars for home care nurses as examples. In total, the framework agreements have a turnover of more than 53 million DKK and constitute about 6% of the total expenses for all goods and services purchased by the Municipality. By the end of 2001, the environment will be rated on par with price, service safety of supply etc. in all tendering procedures.

The general procurement structure is based on the sole supplier principle. Working groups decide on the requirements regarding amount, function, service, etc., and the departments of logistics and environment co-operate in making an "environmental questionnaire" for each product group with detailed questions on the environmental properties of the potential suppliers and their products. In the final choice of supplier, the environment is then rated on par with price, performance, service, etc.

The environmental demands on suppliers and products are in line with both the general Danish environmental policy and the targets outlined in the Local Agenda 21. Minimisation of waste and avoidance of hazardous substances at all stages of the life cycle are two of the main focus points, and low energy consumption is addressed wherever relevant. The demands thus aim at reducing the impacts on the environment not only in Kolding, but also where the products are produced.

The report also shows that also for areas where no framework agreements exist there is an environmental focus. This is especially true for the construction sector, where local policies regarding development of building sites as well as construction, use and disposal of buildings aims at reducing the potential environmental impacts. When the Municipality is responsible for the building, the environmental aspects must be considered, and it is the hope that also private constructors will do the same. Currently, they must only conform to the general legislation in the Municipality.

To ensure that the possibilities in the framework agreements are used by the decentralised purchasers in the Municipality, information meetings between all employees with purchasing responsibilities and the Department of Logistics are held every year. Furthermore, all purchasers have access to the Municipal intranet, where information about the framework agreements, the suppliers and their products is available.

In conclusion, the report shows the Municipality of Kolding as one of the frontrunners in green, public purchasing in Denmark. With a dedicated effort it has been possible to establish and fully integrate a framework for green purchasing in just three years, to the benefit of the local and global environment.

1. Introduction

Kolding Municipality is a substantial buyer. With around 6000 employees, the Municipality is the largest single business enterprise in the region. On an annual basis, the Municipality buys services and goods for an amount of 979.1 mio DKK (131.6 mio EURO).

A wide variety of services are provided to residents of Kolding: teaching, childcare, care for elderly and handicapped people and collection of waste. In addition, the Municipality performs many necessary tasks in areas such as traffic control, environmental care, planning, administration and collection of taxes. A major purchasing activity is linked to these tasks.

1.1 An introduction to Kolding

Kolding is centrally situated in the southern part of the large Danish peninsula, Jutland. The area around Kolding contains some of Denmark's most lovely countrysides. The landscape is richly varied, with hills and dales, woodland and fjords.



One of the beautiful landscapes in the surroundings of Kolding

62.245 people lived in Kolding as at October 15th 2001. The population of Kolding is growing at a much faster rate than the Danish national average.



Windsurfers at Kolding Fjord

Kolding has experienced a striking transformation from its previous role as an agricultural centre into a modern industrial and commercial community. Today the town enjoys a broad industrial base. Sectors include ferrous metals (stainless steel), construction materials, paints, packaging, wholesale and, not last but not least, transport and forwarding of goods.

1.2 The Municipality of Kolding as a green enterprise

In its *Municipality Plan (1998-2009)*, Kolding takes up the obligation to integrate environmental considerations into its full range of activities including the municipal procurement.

Chapter five of the Plan obliges the Municipality to strengthen its environmental efforts through environmental management, green planning and purchasing, and environmental monitoring.

There are several reasons why Kolding has chosen to purchase 'green':

- Green purchasing helps to reduce the environmental impacts which Kolding as a Municipality and as a major buyer is responsible for.

- It helps to promote production, which is to have the least impact on the environment.
- It presents Kolding as a convincing and efficient environmental authority, being in control and dialogue with private enterprises like industry and farmers, regarding for example the use of environmentally hazardous chemicals in production.
- Finally, it sets an example for changed consumption patterns and behaviour towards a reduction of the use of resources for all its citizens.

2. Procurement Structure

The purchasing policy of Kolding is primarily based on sole suppliers in order to achieve the best possible terms. All employees in the Municipality of Kolding are required to comply with the purchasing policy of the municipality. Equally, the suppliers are expected to respect the intentions of the purchasing policy and agreements.

A number of working groups have been established for the co-ordination of purchases in the same product categories. Their task is to decide on the requirements to be met by the product and the supplier, such as amount, function, delivery terms etc. Their work is co-ordinated by the municipal Logistic Service. Before tender documents are prepared a specification is sent to the Environmental Department,



Children fishing for crabs

which contributes with environmental requirements and questions. The organisation is outlined in Figure 1.

All major buying areas are covered by a framework agreement, which primarily is based on limited calls for tenders. In this procedure, there is at first a pre-qualification round that is open to all. Thereafter tenders are invited from a number of selected suppliers. The selection of the potential suppliers to participate in limited calls for tenders is based on selection criteria such as financial status, environmental management, and reliability. Following the selection round, a supplier is chosen from the basis of several award criteria. The selection of the supplier is facilitated by a point score system in which the environment is assessed on par with price, quality, level of service, delivery terms etc.

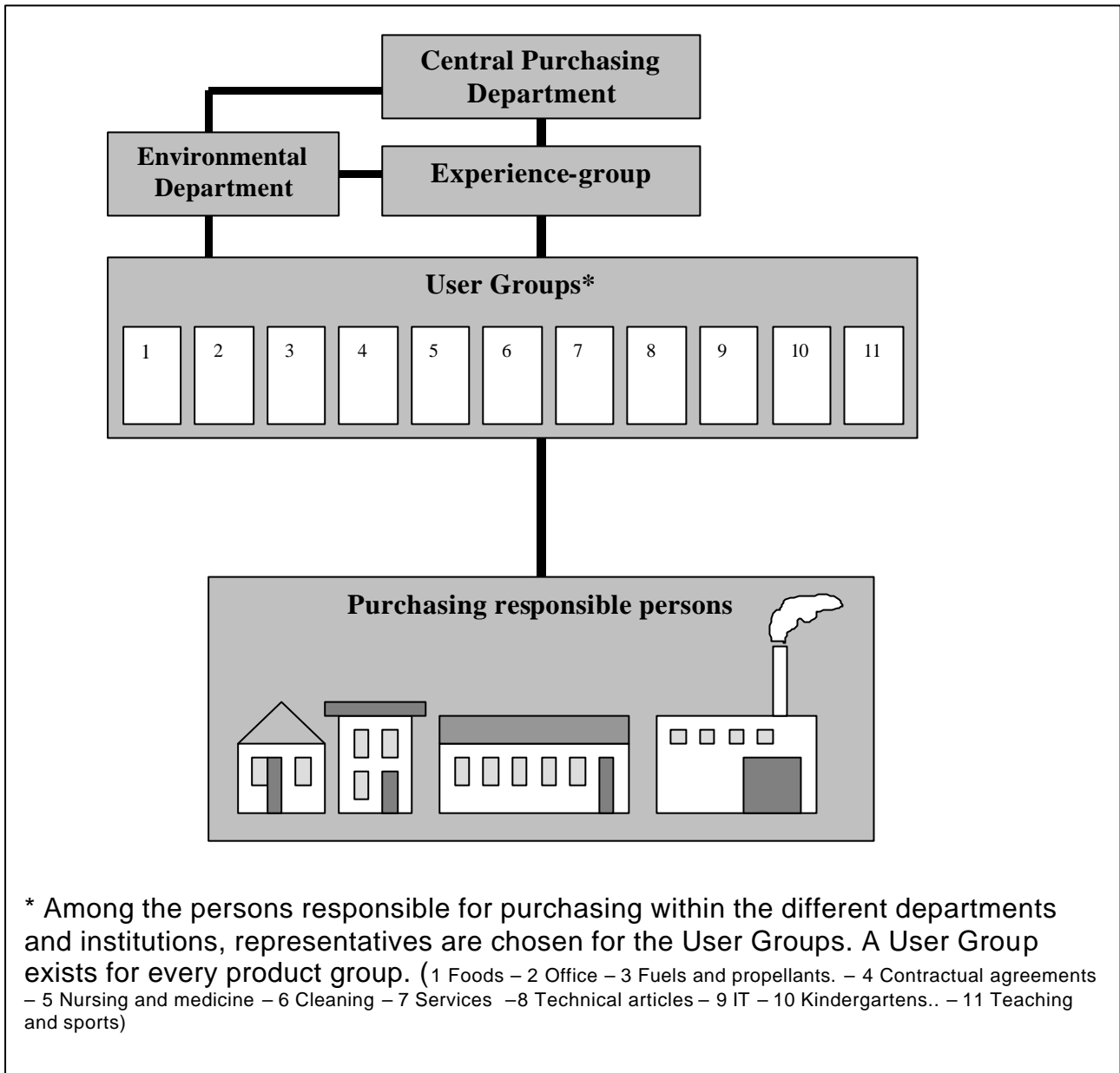


Figure 1. Organisation of procurement in Kolding

2.1 Greening the Purchasing Policy

One of the tasks of Kolding in the *Municipality Plan* was to design a 'green' purchasing policy: This policy was approved by the City Council in 1998, and its purpose is to ensure that all purchasing is undertaken in conformity with the expectations of the Council. In particular it is designed to achieve:

- The right prices
- **Environmental friendly purchases**

- Quantity discounts
- Reliability of supply
- Simplified settlement procedures and minimal administration
- Limited storage costs
- Avoidance of faulty purchasing
- Trust and good co-operation between the City and its chosen suppliers

The green purchasing policy called for an ecological resetting of the purchasing actions. Thus, since 1998 environmental criteria have been integrated into all calls for tenders by environmental questionnaires

about both the production processes and the products themselves.

2.2 The Environmental Questionnaires

The calls for tenders are supplemented on turn by environmental questionnaires. These contain different kinds of questions: regarding the business of the supplier (e.g. environmental management), regarding the product (e.g. use of environmentally hazardous substances, use of renewable resources etc.), packaging, and other issues. An example of an environmental questionnaire (for copying machines, printers and faxes) is provided in Appendix A.

Developed and assessed by the Environmental Department, the questions are formulated in a way, that positive answers indicate positive environmental performance. Any positive answers are associated with a request for supporting documentation.

For every product group there are minimum requirement questions which, if answered to the negative, exclude the bidder from the tendering process right from the start. Here, it is crucial for the buyers to comply with the legal framework conditions that are set for public purchasing, but also specific product properties may exclude the bidder.

All other questions provide the basis for a comparison of the environmental standards of the offered products. The scoring is very simple, i.e. the more positive answers from a bidder, the better. This means that it is very easy to make an integrated assessment of the bids taking price, quality, environment, etc. into consideration with pre-defined weights. The optimal solution from an environmental point of view would of course be to let the environmental properties be decisive. However, for the time being, the possibility of excluding products that do not fulfil minimum requirements secures that the "worst" products are not purchased, and the scoring system secures

that both suppliers and purchasers are motivated for including environmental considerations in their work in an operational and transparent way.

Within the first year, Kolding introduced such questionnaires for 25% of all types of products that are purchased. In May 2001, 70% of the framework agreements were supplemented by environmental questionnaires, and before the end of 2001, Kolding will have reached 100% coverage of all framework agreements.

The design of the environmental questionnaires is started by an extensive research on environmental impacts of products and production. Sources of information are publications, websites as well as reports and guidelines from international and national environmental organisations such as the Danish Environmental Protection Agency (DEPA) and the criteria standards set by the Nordic or EU Eco-labelling bodies. Changes in these criteria will be reflected in the environmental questionnaires when new framework agreements are to be made.



The oldest houses in Kolding

2.2.1 The progress of Green Purchasing

The process of integrating Environmental Questionnaires into the calls for tenders started back in 1997. Some of the first areas were cleaning agents and office materials. Detailed requirements, as at October 2001, have been established for the products in the box below.

Foods		
Meat and fish	Groceries	Coffee and tea
Office		
Envelopes	Forms	Copy- and print paper
Office materials	Office furniture	Graphically works
Copy, print and fax machines	Toner cartridges	
Medical Care		
Corsets, bandages and supporting stockings	Diapers	Products for diabetics
Ostomy and incontinence care	Orthopaedic footwear	Gloves
Cleaning		
Cleaning Agents	Cleaning of schools	Wipe papers
Contractual Agreements		
Bus transportation of pupils and for outings	Taxi driving	Pest Control of Rats
Technical Articles		
Textiles (Carpets and curtains)		
Toys		
Toys for day care, kindergartens and after school	Occupational materials	
Schools and leisure		
Body and make up paints	Paint boxes	Books
Other product groups		
Pumping of septic tanks	Run of an Elderly Centre	Cars for home care nurses
	Wash of textiles	Winter maintenance of roads

2.3 Information and monitoring of Green Procurement Activities

All employees in Kolding Municipality with purchasing responsibilities are required to comply with the conditions contained in framework agreements including any sole-supplier provisions.

To ensure that every purchase complies with the framework agreements several activities have been established:

- A pamphlet; "That's the way we purchase in Kolding Municipality" has been distributed to all employees describing the conditions every purchaser is required to comply with
- A pamphlet; "Selection of suppliers" has been published to serve as information about the procurement procedures
- Once every year all the municipal employees with purchasing responsibilities are invited to a half-day information meeting with the Logistics Department about their responsibilities as a pur-

chaser and about the purchasing procedures. These meetings also address environmental issues.

- Every employee with purchasing responsibilities has access to the Municipal Intranet where information about framework agreements, the suppliers, and the products are available.



Canoeing at Kolding Å

Within the annual green accounts which every municipal unit such as the Town Hall, the different Administration Centres, kindergartens, and schools are obliged to prepare, the different units have the responsibility to provide information about their contribution to the Municipal purchasing policy, e.g. to mark or in another way tell if their purchases are green.

2.4 Procurement in the local and national context

Green procurement is a part of the Local Agenda 21 activities of the city of Kolding. The City Council of Kolding approved in May 2000 twenty-eight local Agenda 21

aims for sustainable development. These Local Agenda 21 aims are to be considered and integrated into all activities.

Thus, the Agenda 21 aims are integrated in the purchasing questionnaires when relevant. As an example, one of the aims requires a decrease in emissions of heavy metals and environmentally hazardous chemicals (xenobiotics) to the sewage water systems and wastewater treatment plant. Therefore, one of the questions asked in the questionnaires is if the product is produced without the use of such chemicals.

At the National level, the Government requires local authorities to take national aims into account in their planning process, e.g. aims which refer to a decrease of waste amounts, an increase in sorting waste at source and to a decrease of emissions from energy production and consumption. These National aims are also integrated into the purchasing questionnaires.

3. The Amount of green purchases

In 2000, the Municipality of Kolding purchased goods, acquisitions and services for an amount of 979,1 mio. DKK (131,5 mio €). The distribution can be seen in Table 1.

General heading	Examples of products and services	Amount spent in 2000		Green Purchasing ¹		
		mio. DKK	mio. EURO	Yes	No	Some
Purchase of goods and acquisitions	Total	238,2	32			
Foods	Bread, dairy products, meat, fish, the, coffee, vegetables	14,2	1.9			X
Fuels and propellants	Gasoline, diesel, electricity	105,7	14.2		X X X	X
Building sites	Plots for Industrial development and Urban development	8,3	1.1		X X	
Acquisitions and depreciations	Machines, vehicles, technical installations	5,6	0.8		X	
Other Purchases	Framework Agreements (See detailed description below) Single purchases	104,3	14.0	X		
Services	Total	740,9	99.6			
Services without taxes	Administrative services. Tax, fees and insurances. Health care services. Person transports	164,7	22.1			X
Payments to State, County and other Municipalities	Surveys and treatments at Hospitals, Civil defence. Expert advices	158,8	21.3			
Contractors and trades	All expenses to construction, repair and maintenance which are not done by municipal workers	192,5	25.9			X
Other services	Computer data bases and software. Telephone. Revision. Sweeping of chimneys. Waste collection	224,9	30.2			

Table 1. An overview of purchased product groups, amount spent in 2000 and groups covered by green purchasing.

The overview is based on the figures that are readily available from the accounting system of the Municipality. In the following sections, a greater level of details is shown for selected areas, and the content of other headings is shortly described.

3.1 Purchases of goods and acquisitions

3.1.1 Foods

In the year 2000 Kolding food purchases totalled 14,2 mio. DKK (1.9 mio €). Of these, 7,8 mio (app. 1 mio €) were used within the Framework Agreements. There are several reasons why some food purchases are not covered by a Framework

¹ Yes, No and Some refers to the inclusion of environmental questionnaires in the tendering procedure.

Agreement. For instance the municipal Kindergartens find it educational to go for an outing with their children for purchasing food at the local grocer. Some purchasers want to buy vegetables at the local green-grocers to get more fresh vegetables. Food purchased within the Framework Agreement is mostly for use in kitchens in Elderly Centres and Canteens in Administration Centres. Environmental specifications for the purchasing of organic and conventional foods are described in section 5.4.

3.1.2 Fuels and propellants

Fuels and propellants for every day activities in Kolding are not targeted by requirements to the product, either because it is not possible to distinguish between the products from different suppliers (gasoline, fuel oil and diesel from different suppliers origin from the same refinery and have the same environmental properties) or because the market is not free (there are currently political constraints on the purchase of electricity and heating).

3.1.3 Acquisitions and depreciations

“Acquisitions and depreciations” cannot be defined unequivocally and vary substantially from one year to the next to be included in the calculation of the amount of green purchases. The product group covers products such as lorries, machines, and technical installations such as elevators, boilers, heaters, ventilators, and apparatuses.

3.1.4 Other purchases

The heading “Other purchases” covers the most interesting products in relation to green purchasing. Most products under this heading are purchased by the use of framework agreements where it is possible to specify environmental requirements in the tendering process. This part is charac-

terised by purchases, which do not differ significantly from one year to another, and in addition go across all municipal units. Therefore it gives a realistic picture of the amount of green purchases. By green purchases is meant purchase of products where environmental questionnaires including requirements to the product and the supplier have been integrated into the tendering process, and where the environmental properties have been assessed on par with other terms like price and safety of supply.

Despite the large variety of products, environmental requirements have been integrated in about 70% of all purchases (May 2001), and it is the aim to reach 100% coverage in 2001 (Figure 2).

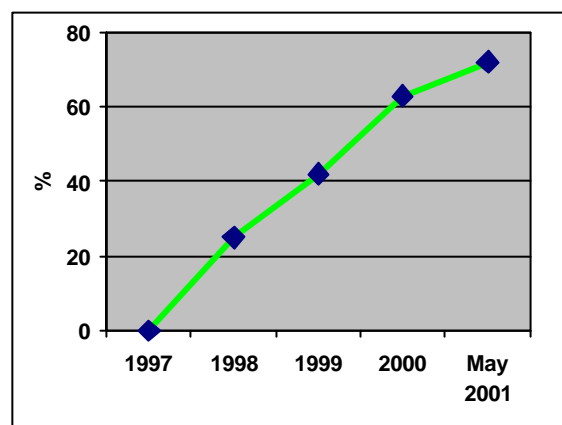


Figure 2. The percentage of Framework Agreements where environmental questionnaires have been integrated into the tendering process.

The public accounting system does not currently allow for a great level of detail with respect to the amount of green purchases under a given heading. This is reflected in Table 2 where it has only been impossible to provide details for certain product groups. The Danish EPA is currently investigating how this can be achieved, and the Municipality of Kolding is in the process of developing an electronic form for the registration of green purchases.

The other part of the group, “Other purchases” mainly includes single purchases which differ from one year to another and which often only cover one group of personnel. It could, for example, be the purchase of 15 cars in one year for 1,5 mio DKK (0,2 mio €) to the home care nurses, and the next year 1,500 items of school furniture for 4,1 mio DKK (0,55 mio €). Most of these single purchases are “green” purchases as environmental questionnaires are integrated into the tendering process.

3.1.5 Services

The area of “Services” comprises of a large variety of products, as given in Table 1 above. “Services without value added tax” and “Payments to State, Counties and other Municipalities” include many kinds of health services. The former also includes areas where public and private companies are competing in tendering processes and therefore must have similar economic terms.

Regarding services contained under the heading “Contractors and trades” Kolding has just recently started the work of integrating environmental demands in the service contracts. The pioneer areas will be development of building sites, construction and maintenance of sewers, and maintenance of buildings owned by the Municipality. The first environmental demands introduced under the heading primarily aim at taking precautions to avoid unwanted impacts on the local environment during the development of building sites (e.g. regarding leaching of chemicals), but also include product-related requirements directly (e.g. avoidance of PVC in sewer systems) and indirectly (e.g. by specifying noise levels at building sites).

An overview of the distribution within the different groups of purchases and the amount of green purchases within these different groups can be seen in Figure 3 and Table 2.

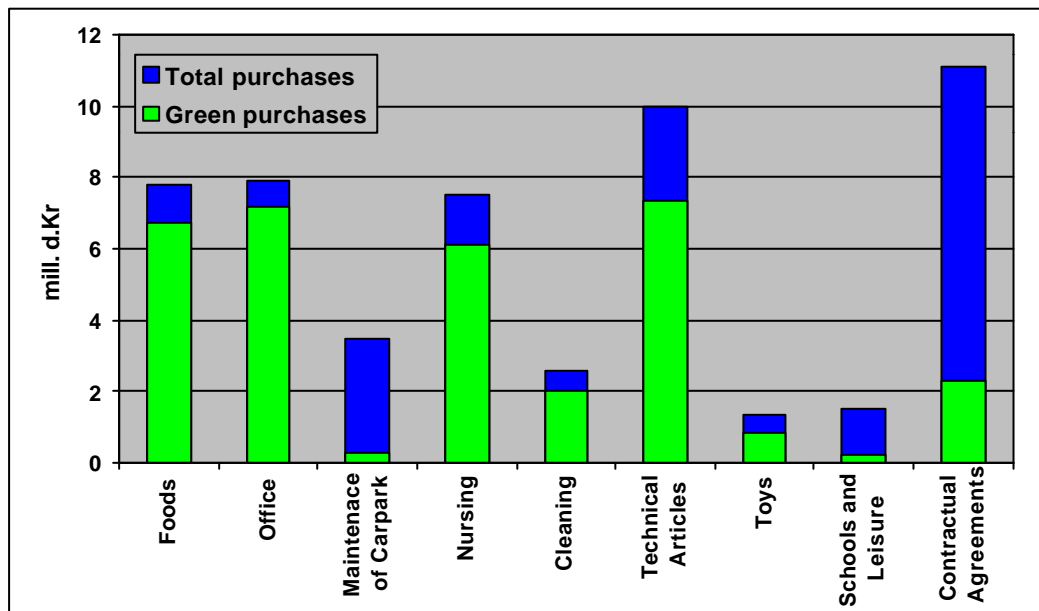


Figure 3. In 2000, the Municipality of Kolding purchased for 54 mio DKK within the Framework Agreements. The above figure shows the distribution on different groups and the amount of these which are green purchases (1 € = 7.44 DKK).

Framework Agreements	Purchases in mio. DKK		Purchases in mio. EURO	
	Total	Green	Total	Green
Foods total	7,8	6,73	1,04	0,90
- Colonial, diaries	4,54	4,54	0,61	0,61
- Meat	1,70	1,70	0,23	0,23
- Kitchen machines	0,99	0,50	0,13	0,07
- Beer, soft drinks, wine, the and coffee	0,57	0	0,08	0
Office total	7,9	7,2	1,06	0,97
Office materials;				
- Copy and print paper	0,80	0,8	0,11	0,11
- Pens, pencils, markers, folders, plastic sheets etc	2,10	2,1	0,28	0,28
- Forms, envelopes, pre-printed paper, service of printers	1,90	1,2	0,26	0,16
- Furniture	2,50	2,50	0,34	0,34
- Copy machines, printers and faxes	0,61	0,61	0,08	0,08
Maintenance of car park	3,5	0,34	0,47	0,05
- Tires				
- Motor oils				
- Spare parts				
Nursing total	7,5	6,1	1,0	0,82
- Nursing equipments				
- Personal aids				
- Diapers				
- Medicine				
Cleaning total	2,6	2	0,35	0,27
- Cleansing agents	1,8	1,8	0,24	0,24
- Wipe papers	0,2	0,2	0,03	0,03
- Vacuum cleaners	0,6	0	0,08	0
Contractual agreements	11,1	2,3	1,49	0,31
- Car rental				
- Travels by train and planes				
- Accommodations				
- Pharmacy				
- Library books				
- Nursing of plants				
- Bus transportation for outings	2,3	2,3	0,31	0,31
- Pest management	0,3		0,04	
Technical articles	9,965	7,37	1,34	0,99
- Timber merchandises				
- Carpets and curtains				
- Tools				
- Gloves, boots, and overalls				
Toys	1,34	0,81	0,18	0,11
Schools and leisure	1,51	0,21	0,20	0,03
-Books				
-Occupational materials				
Total	53,21	32,76	7,15	4,40

Table 2. The amount of purchases within Framework Agreements shown as total purchases and green purchases in mio. DKK and in EURO.

4. Financial data for purchase of RELIEF products in Kolding

In the course of the local analysis, the RELIEF project studied the environmental impacts and policy relevance, the financial relevance, the green product and organisational specifications as well as the purchasing practices of the six participating European cities on a set of 16 core product groups, complemented by some additional city specific products.

The 16 core product groups were chosen by the RELIEF scientific and local partners as being particularly relevant in the public purchasing process. A questionnaire was developed to take the interests of all partners into account and additional product

groups were included in the survey. Table 3 presents the product groups studied and their financial importance.

To investigate the economic importance of the selected product groups, the accounts in the Municipality of Kolding have been subject to a closer examination in which yearly purchases in different departments have been added in order to provide one figure for the overall purchases of the Municipality.

Product group	Expenditures per year (1000DKK)	Expenditures per year (1000EURO)	% of purchasing expenditures
Cleaning products or services	1800	242	1,00
Energy (electricity/heating)	17720	2382	9,89
Floor coverings	Information not available		
Food for canteens	14208	1910	7,93
Furniture, partition walls, doors	2500	336	1,40
IT equipment	7049	947	3,93
Lighting	8574	1152	4,78
Lorries+ diesel	6500	874	3,63
Medical care	7500	1008	4,19
New buildings	61.574	8276	34,36
Paper	1108	149	0,62
Office materials	2100	282	1,17
Person transport	17064	2294	9,52
Pest management	316	42	0,18
Printing	Information not available		
Renovating buildings	29.266	3934	16,33
Sanitary and water heater*	100	13	0,06
Toilet paper, napkins, hand-drying	200	27	0,11
Toys	1335	179	0,75
White goods	280	38	0,16
Total	179194	24085	100,00

Table 3. Expenses for purchasing of the selected RELIEF products in the Municipality of Kolding.

4.1 General comments to the figures

The figures in Table 3 have been collected from the Municipality Accounts 2000 and by kindly asking central and de-central purchasers for help in defining the details and meanings of the purchases. Some figures have been obtained from the suppliers.

It can be seen from the table that New buildings and Renovation of buildings are the two major expenses in the Municipality of Kolding. However, both product groups include labour costs, whilst the expenses of materials and products used within the two product groups are of a lower order of magnitude. It is not possible to specify the expenses in more detail.

Other important product groups are Energy (electricity and heating), Person transport, Lighting and IT-equipment. All of these product groups have consumption of fossil fuels as an important element.

Some of the expenses can be described in more detail (see below), but it is not possible to produce precise figures based on the information in budgets and accounts.

The information in the table is presented graphically in Figure 4. The product groups "New buildings" and "Renovation of buildings" have been excluded to create a better overview of the less expensive product groups. The product groups "Printing" and "Floor coverings" have also been omitted due to no information being available.

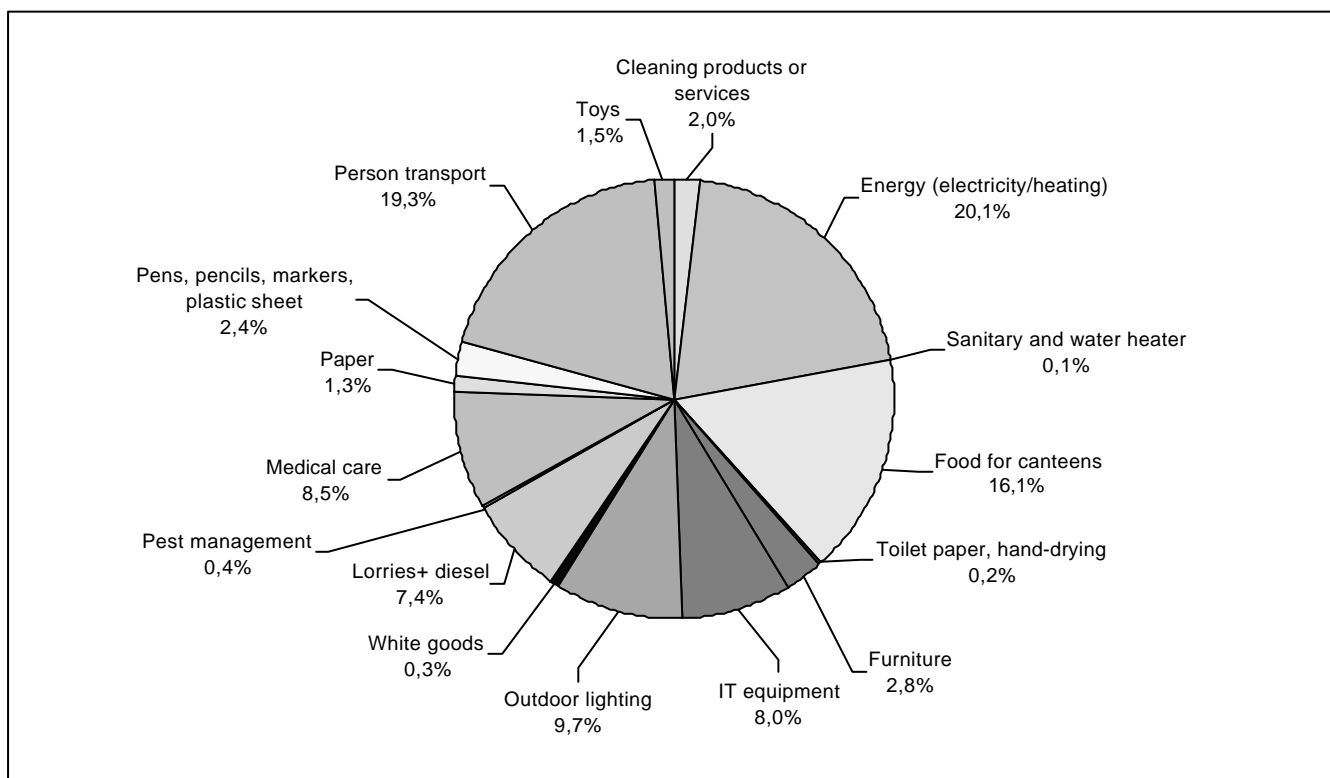


Figure 4. Overview of the relative expenses, excluding New buildings and Renovation of buildings as well as product groups for which no information is available

Of the remaining groups, “Food for canteens”, “Medical care products”, and “Lorries and diesel” are most important. For the latter, it should be observed that here fossil fuels (diesel) also plays a significant role. The remaining 11 product groups only play a minor role in the budget (they consist of about 8% of the expenses in total). However, they are still important in relation to environmental aspects because there often are many products and suppliers to choose from, some of them being able to supply products with preferred environmental properties.

4.2 What do the product groups include?

In order to make eventual comparisons with other municipalities participating in the project possible, the following remarks to each of the product groups may be of importance. For some product groups, more information can be found in the description of financial and environmental aspects in the following sections.

- *Cleaning products and services* only include expenses to cleaning products. Labour costs are thus not included.
- *Energy* includes two different types, i.e. electricity and heating. Electricity accounts here for about 57% and heating for the remaining 43%. A further division into expenses for district heating and local boilers is given in a subsequent section.
- *Floor coverings*. This post cannot be specified, as it is an integrated part of the product groups “New buildings” and “Renovation of buildings”.
- *Food for canteens*. Kitchen machines are included in this product group along with beverages (beer, soft drinks, coffee, tea, etc.). Food thus accounts for only about 80% of the overall expenses.

- *Furniture, partition walls, doors*. The expenses only cover furniture purchased under the framework agreement with one supplier. This may underestimate the budget post significantly as a major part of furniture purchases are decentralised. The purchase or leasing of school furniture plays a significant role some years, but not in others (2000 is an example of a year without purchases of school furniture). Furthermore, purchases of partition walls and doors are integrated into the purchase and renovation of buildings.
- *IT-equipment*. Includes purchase and leasing of all types of IT-equipment (computers, printers, copiers, faxes and their combinations).
- *Lighting*. Concerns only road lighting with 58% being spent on electricity, 40% on maintenance and about 1.5% on improvements. Purchase of lamps, fittings, etc., is either made by decentralised purchasers or integrated in New buildings and Renovation of buildings.
- *Lorries and diesel*. Lorries account for about 52% of the expenses here. Included is purchase of vehicles > 3,500 kg used for waste transport, civil defence, and road maintenance. Other departments may also have purchased relevant vehicles but no information has been available so far. Fuels (diesel, petrol) for lorries account for the remaining 48%.
- *Medical care*. Includes aids and appliances for handicapped persons, medicine, napkins, etc. It is not possible to make a further division of the figures.
- *New buildings*. In 2000, the Municipality has built youth apartments and a care centre for elderly people. The budget post can vary significantly from one year to the other but will always include floors, walls, sanitary installations, etc. Labour costs are also included.

- *Paper.* Copy and print paper is included along with pre-printed forms and envelopes
- *Office materials* (Pens, pencils, markers, plastic sheets, etc.) The mentioned articles are only examples of the products bought from the supplier of office material.
- *Person transport.* Includes transport of school pupils (15%), transport of patients and elderly people (11%), and public transportation (74%). Public transportation can be further divided into contribution to the transportation service system of the County (60% of total), rent and maintenance of garage sites (1.5%), maintenance of shelters and toilets including electricity and water (4%), and operation of the local airport (8%). Labour costs are included in many of the expenses.
- *Pest management.* Rat control accounts for more than 95%, control of pigeons and wild cats for the remaining expenses.
- *Printing.* No information is available for the year 2000. Printing services are purchased decentralised from a large number of service providers. From 2001 a framework agreement will be established.
- *Renovation of buildings.* Comprise of many different activities from the painting of the municipalities' apartments to larger renovation projects. Labour costs are included.
- *Sanitary installations and water heaters.* Includes only water saving toilets purchased as part of the energy action plan. In general, other purchases (including toilets) will be integrated into the purchase of new buildings and renovation of old buildings.
- *Toilet paper, napkins, hand-drying.* Does not include napkins. These are included under the heading medical care.
- *Toys.* Used in public and private day care.

- *White goods.* Includes only purchases of energy and water-efficient refrigerators, freezers and washing machines that are replaced as a part of the energy action plan. The purchase of other white goods are integrated in the expenses for new buildings and renovation of buildings.

5. Financial and environmental aspects of the product groups

As described in the beginning of the report, green purchasing in Kolding is based on the inclusion of environmental considerations when establishing the framework agreements that are used by most purchasers in the institutions in Kolding.

The following sections describe in some detail the actual content of the Environmental Questionnaires that each bidder must answer in order to be considered in the tendering procedure.

It is a general feature of all environmental questionnaires that they address three issues, i.e. the supplier/producer, the products, and their packaging. Similar questions have been used for some product groups but it is nevertheless chosen to provide details for each product group. It is the hope of Kolding that the environmental questionnaires can be an inspirational to other municipalities in Denmark as well as in other countries.

5.1 Buildings

Building of new buildings and renovation of old buildings plays an important role in the budget of the Municipality of Kolding – as in most other municipalities. In 2000 purchasing of new buildings thus amounted to about 61 mio DKK (8.2 mio €) and renovation of old buildings to 29 mio DKK (app. 4 mio €). Additionally, about 35 mio DKK (4.7 mio €) were spent for purchasing and

development of building sites for residential and industrial buildings.

The environmental impacts from buildings are significant over their lifetime. The Municipality of Kolding has for several years participated in the development of a framework for green buildings, both through networking activities and through specific projects. This is anticipated to be a long process and the Municipality emphasises that a good documentation system in combination with a legal framework is probably the best long-term solution.

Until the “best” solution has been established the Municipality has developed a framework that addresses the most important issues. For all new buildings where the Municipality has a financial involvement (e.g. public institutions, private housing with public support, and certain urban renewal projects) an environmental impact assessment should be performed. The Municipality also encourages private construction companies to follow the same guidelines and it is possible to obtain guidance from the Municipality. However, the experience so far is that it is difficult to get construction companies to co-operate in this voluntary effort.

5.1.1 Construction phase

The following elements are included in the assessment and the subsequent prioritisation of the work when the Municipality is actively involved in the building process:

- Avoidance of urban congestion
- Good architecture – e.g. with a good relationship between aesthetics and functionality
- Low resource consumption during construction and usage of the building
- Low energy consumption and minimal maintenance in the use of the building
- Minimum consumption of xenobiotic substances
- Use of non-allergenic building materials
- Possibilities for recycling of old buildings and their materials
- Good conditions for waste treatment and recycling efforts
- Local draining of rain water

Additional to these general requirements, the Municipality participates actively in the process where possible. The first possibility is in the development of building sites for residential and industrial purposes. In this initial development phase, care must be taken that the construction work will not have any unnecessary impacts, e.g. by forgetting to protect drinking water sources from seepage of oils and hazardous chemicals or by choosing the “wrong” materials. Furthermore, contractors are obliged to take the existing environment into consideration, e.g. by keeping the vegetation intact as far as possible and protect it from future impacts. These are the ideas behind an environmental questionnaire that has already been developed but not yet been applied in practice. Before this can happen, the departments in charge of site development must be consulted to approve the process. It is thus possible that the content of the questionnaire, as outlined, will be changed. This is secured by having contractors answering an environmental questionnaire in the tendering process.

The first part of the questionnaire is used for pre-qualification and contains questions regarding the policies of the contractor with respect to environmental management, energy and waste, including the existence of procedures for handling of acutely developed pollution.

The second part of the questionnaire concerns how the building site will be handled. Important issues are for example that the contractor must confirm that washing areas

and storage areas for diesel, petrol and other liquids are situated at specially fortified places with the possibility of collecting possible spills. Other issues are that legal working environmental requirements are fulfilled, e.g. with respect to exposure to noise and dust. Finally, the contractor must confirm that trees, bushes etc. that are to remain when the building is finished are unharmed and that the soil is treated in a way that allows new plants to grow. The third part of the questionnaire concerns the materials used, e.g. that recycled and recyclable materials are used for sewage systems, for drinking water systems that the tubing is made of polyethylene and that no organic solvents are used in gluing processes.

The potential impacts in the construction of the building itself are probably larger than in the development phase. The Municipality of Kolding finds that it is impossible in relation to both time and resources to make a full assessment and description of the environmental impacts of the building materials used. It is therefore a wish for the Municipality that a simple and transparent environmental labelling system is established at the EU-level, however with a possible recognition of certain Danish aspects. In the meantime, the Municipality of Kolding requires that an assessment be made as outlined earlier.

5.1.2 Use phase

The largest impacts of a building occur during its use where there is a large consumption of energy, water, and cleaning agents, etc. The Municipality of Kolding demands that in its new buildings the heat loss must be at least 10% less than the legal requirements for Danish buildings. For renovated buildings the energy consumption must be reduced by 20% in relation to the consumption before the renovation. Insulation and other energy saving measures

must for all buildings be established if the pay-back time is less than 8 years. Kitchens must be prepared for installation of energy efficient refrigerators and freezers (A-labelled) and washing machines can be connected to both cold and hot use water, the latter from the district heating.

The production and consumption of energy (electricity and heating) in buildings are seen in an integrated perspective. One of the most interesting activities is the establishment of a large-scale photo-voltaic "power plant" during the renovation of a building complex. The photo-voltaic cells are integrated in the building structure and deliver about 60% of the annual consumption of electricity in the building (106.000 kWh). On the more general level, the Municipality of Kolding stresses that electricity for the heating of buildings should be avoided. Instead, the collective supply of district heating (from the local waste incineration plant and the nearby Skærbæk power plant) should be utilised as much as possible and with a view also to the supply to other cities in the region. This is elaborated in the section on "Energy".

Clean drinking water is abundant in Kolding. There are still untouched reserves and the magazines currently being pumped from are filled in line with the consumption. The consumption of drinking water has been decreasing in the past years, partly because of a improved condition of the water pipes (fewer leaks), but also because of increasing consumer prices which specifically promotes water saving behaviour. The greatest concern is the potential pollution of the water resources of the Municipality. Small incidents of ground water pollution are known to have occurred but have so far not posed a risk for lack of clean drinking water. However, the potential problem is taken seriously as evidenced e.g. by the requirements when developing new building sites.

With contractors being responsible for the environmental aspects of new buildings and renovation of old buildings, the Municipality of Kolding only purchases white goods and sanitary installations to a minor extent (in 2000 about 50.000€ was spent for these products). There are however cases where it is possible for the Municipality to exert an influence of the environmental properties of specific products. Examples are purchasing of water-saving toilets and energy-efficient white goods where the Municipality has chosen the best available products on the market. There is however little doubt that the general demands outlined above exerts a much larger influence for these product groups than the occasional purchasing activities of the Municipality.

5.2 Cleaning agents

The product group cleaning agents consists of a number of sub-groups, e.g. dish-washing agents (hand and machine), all-purpose cleaning agents, sanitary cleaning agents and toilet cleaning agents. Within each of the sub-groups there are a large number of products available that can fulfil the specific requirements.

In 2000 the Municipality of Kolding purchased cleaning agents for 1.8 mio DKK (about 242,000 €) through the framework agreements. Additional purchases may have been done de-centralised but are not assumed to constitute a significant part of the overall purchase.

Cleaning agents may affect the local environment and the occupational health of the employees. The aquatic environment is affected because the wastewater from the cleaning tasks eventually ends up here. Despite an efficient wastewater treatment there still remains residues of the chemicals in the effluent from the treatment plants and these are of major concern in Kolding.

Examples of unwanted substances in the aquatic environment are tensides and surfactants. As they are the active ingredients in the washing process they cannot be avoided, but it is possible to choose active agents that have less impacts than others. As an example, brown soap is preferred to LAS (linear alkyl benzene sulfonates). Solvents and complexing agents can also have a serious impact on the aquatic environment, but again it is possible to choose products without the most problematic constituents and still achieve a good cleaning result. As an example, soda is preferred to EDTA.

When establishing a framework agreement with a supplier, the company must answer an environmental questionnaire. As for other product groups the questionnaire addresses the supplier as well as the products.

For the supplier, questions are asked regarding environmental management, green accounting, waste and distribution policies and more specifically, regarding treatment of wastewater from the production processes.

For the products the primary focus of the questions is on the availability of eco-labelled products and instructions for the correct dosage of the agents. If eco-labelled products are available these can be assumed to be the best on the market with respect to having low environmental impacts. Instructions concerning the correct dosage is in focus because this is seen as a main option for decreasing the consumption of raw materials as well as the emissions to the environment, irrespective of the environmental properties of the products.

The secondary focus is on the environmental properties of the products, reflected by the groups of chemicals applied to fulfil a given function. The Municipality of Kold-

ing has adopted the so-called SKAL-system for ranking of different types of active ingredients. The system is used for pinpointing the most preferable groups of substances from an environmental point of view and the questions give a clear indication of this. There are also questions regarding unnecessary constituents, e.g. optical brighteners and perfumes that do not have any functions in the product.

Finally, the questions reveal whether the ingredients with the most serious impacts are avoided, e.g. there are specific questions regarding the amount of EDTA, phosphonates, NTA, and reactive chlorine compounds present in the products. In this

context, questions regarding the bioaccumulation potential have been included, along with a question of whether any of the constituents are on the list of undesirable substances from the Danish EPA.

5.3 Energy

Purchase of electricity and energy for heating of public buildings is one of the main posts on the budget for the Municipality of Kolding amounting to 17.7 mio DKK (about 2.4 mio €) in total. This figure can be further broken down into purchase of electricity and different fuels for heating (Table 4):

Product	Expense	% of total	% of sub-total	Amount purchased (MWh)
Electricity	10.000.000 DKK	56%		10.000
Heating	7.700.000 DKK	44%		
• Natural gas	1.376.000 DKK		17.9%	4.911
• Fuel oil	161.000 DKK		2.1%	576
• District heating	6.163.000 DKK		80%	21.997

Table 4. Purchase of electricity and heating in Kolding in 2000.

As it can be seen from the overview, the main expenses are related to electricity and district heating. Both at the local, regional, and national levels large efforts are devoted to securing a reliable supply of energy produced with as little environmental impacts as possible, and the possibilities of green purchasing must be seen in this perspective.

At the national level the main goals are to reduce the overall energy consumption by 15% at the end of 2005 (compared to 1988) and to reduce the CO₂-emissions by 20% also compared to 1988. The latter goal shall primarily be reached by decreasing the use of fossil fuels while the overall reduction in the energy consumption must be reached by changing the consumption pattern broadly defined.

Electricity and district heating to the Kolding area are to a large extent produced in combined heat and power plants (CHP). Fuel oil and natural gas are only used for heating purposes to a minor extent, as indicated above, and sustainable energy sources are currently of no significance, the exception being a battery of photo-voltaic cells installed during the renovation of buildings (see the section on Buildings for more detail). Electricity, district heating, and town gas (for cooking) are distributed by one company while natural gas is distributed by another company covering large parts of Jutland and the island of Funen.

The largest producer of electricity in the Kolding area is the power plant at Skærbæk but also decentralised CHP's produce

electricity, the waste incineration plant in Kolding being the most important.

District heating is produced in connection with the production of electricity at both the Skærbæk plant and the Kolding waste incineration plant. In addition, two large companies in the Kolding area produce surplus heating that is used for district heating in Kolding as well as its neighbouring cities.

The production of electricity and district heating in combined heat and power plants is always interrelated because production of electricity always will produce heat as a by- or co-product. The Skærbæk power plant has the primary obligation to supply district heating in the Kolding area. In the winter season (November 1 to April 1) the need for heat is often larger than the need for electricity and surplus electricity must therefore be produced and sold. This is not always an optimal solution from an economic and environmental point of view.

In very cold periods the production of district heating at the Skærbæk plant and the Kolding waste incineration plant is not sufficient to cover the needs. When this is the case, local district heating plants are started using fuel oil as the primary energy source and with no concurrent production of electricity.

In the summer season the need for district heating is at a minimum. The heat is however still produced as a by-product from the electricity production, and the heat from the Skærbæk plant must be disposed of by emitting it to coastal waters (Lillebælt). Surplus heat from other suppliers, e.g. the Kolding waste incineration plant, must be cooled off by using energy.

The very short overview outlined above depicts a very complex situation that cannot be handled at the local level alone. Thus, the Danish government has introduced strong incitements (subsidies and taxes) to

promote the use of cleaner technologies and sustainable energy sources in the energy production. To reduce the apparent inefficiency of local energy production in the Kolding area, short-term efforts are directed towards creating a market for the surplus in heat in the summer season and to reduce both the consumption of heat during winter and electricity during summer.

One of the main possibilities for this is assumed to be in the building of energy efficient houses. This is dealt with in some more detail in the section on "Buildings" outlining the general requirements for new houses and in relation to urban renewal.

Energy Management is another option for the reduction of energy consumption and has been used in Kolding for several years. The targets set for Kolding are a reduction of 16.5% in consumption of heat in 2005 compared to the 1988-level. In 2000 a reduction of 12.7% was achieved together with reductions in electricity consumption of 4.3% (2005 target: 13%) and water savings of 38.9% (2005 target: 20%).

5.4 Food for canteens and kitchens

The Municipality purchased "Food for canteens" for 14.2 mio DKK (1.9 mio €) in 2000. Of this sum, 7.8 mio DKK (1.0 mio €) was spent on purchases under the framework agreements; one million DKK of these were however spent on kitchen machines. Of the remaining sum, 4.5 mio DKK (0.6 mio €) was spent on groceries and dairy products, 1.7 mio DKK (0.23 mio €) on meat products and about 0.6 mio DKK (0.08 mio €) on beverages (beer, soft drinks, tea, coffee and wine).

As a part of the Local Agenda 21 in Kolding it is a political decision that the operation of all public canteens/kitchens should be performed with environmental considerations ("Canteens should be environ-

mentally friendly”). Due to practical and economical conditions the interpretation of this needs to be flexible, the first decision being that environmentally friendly does not mean that all food products purchased need to be organic.

A practical reason for not always purchasing organic food is that the versatility of the products is rather low. Another is that the period from order to delivery under the previous framework agreement was too long making it difficult for the personnel to organise their work. During the period of the framework agreement the main supplier of organic foods went bankrupt and the potential supply of organic foods therefore ceased to a large degree.

On the economic side the Municipality has realised that organic foods are more expensive than conventional foods. The necessary budget increases have been met with scepticism and unwillingness from some politicians. Therefore it is up to each institution with a canteen or kitchen to decide on how the budget is spent in the best possible way, taking into account the opposing economic constraints and Local Agenda 21 process

In order for all institutions to be given full prospects four new framework agreements have recently been established. Two of the agreements – one for butcheries and one for groceries - are for organic foods, the other two for conventional food – also for butcheries and groceries. The aim of the questionnaire to “conventional” suppliers is to secure that the product range offered to the canteens is produced with environmental considerations even if it is not organic. The aim of the questionnaire for the organic framework agreement is to secure that the products offered are in fact are organic.

The demands on the supplier and on the packaging are almost the same as in the

environmental questionnaires used in the tendering procedures. For the supplier it is positive if an environmental management system is in operation, green accounts and distribution policies are available, and waste sorting is performed. For groceries there is an additional question regarding the country of origin being stated for all products. The only difference between the questions to potential suppliers of organic and conventional foods is that “organic” suppliers are asked whether all their products are certified organic, whereas “conventional” suppliers are only asked if some of their products are certified as organic.

In regards to packaging the following questions are asked to all potential suppliers:

- Is the packaging made without the use of chlorine-containing plastics?
- Does the packaging contain recycled materials?
- Do printing inks contain heavy metals?
- Has the packaging been produced without the use of substances from the list of undesirable substances, published by the Danish EPA?
- Minimal packaging is used, i.e. secondary and tertiary packaging is avoided as far as possible?

5.4.1 Organic butcheries

For organic butcheries the product-related questions are few and simple, i.e. whether the animals have had access to open-air grazing areas and if all colorants and additives are approved by organic certification bodies (the Danish “Ø”-label, the Swedish “KRAV” or the Dutch “ECO”).

5.4.2 Conventional butcheries

For conventional butcheries there is a question regarding whether the animals have had access to open-air grazing areas. Otherwise, the questions relate pri-

marily to the use of different chemical agents during the growth of the animal.

- Is the animal production done without use of growth stimulators?
- Are antibiotics only used for curing of diseases and not for preventive purposes?
- Is the fodder without genetically modified organisms?
- The content of residual pesticides in the fodder is below current threshold limit values?
- Is the amount of residual pesticides in the product below current threshold limit values?
- Are colorants and additives accepted for use in food products?

5.4.3 Organic groceries

For groceries the questionnaires are more elaborate, both for conventional and organic suppliers. For organic suppliers the questionnaire aims at securing that the demands in certified organic farming are observed. For example, vegetables are grown with controls on water and fertiliser consumption, only biological pesticides are used, all colorants and additives are accepted by the certifying body and clearly stated on the packaging, growth of vegetables is done in open fields or in greenhouses with climate control. Furthermore, questions are asked on whether the content of hazardous heavy metals and mycotoxins is below threshold limit values.

5.4.4 Conventional groceries

The same questions are asked to conventional suppliers providing an indication of their status in relation to organic farming. Additional questions aim at indicating the difference between “good” and “bad” conventional farming:

- Is the grain grown without use of growth regulators?
- Is mechanical weed protection applied?
- Is biological pest management applied?
- Are the accepted pesticides and herbicides only used?
- Do the products contain gene modified material?
- Is the amount of residual pesticides in the product below current threshold limit values?

Thus, the environmental questionnaires have at least two purposes. Firstly, they give the institutions the possibility of choosing between organic and conventional suppliers removing the practical constraint in everyday purchasing. Secondly, they identify the basic environmental properties of the products supplied by the conventional supplier. The Municipality of Kolding thus acts as a

market driver, although not to the full extent.

5.5 IT-equipment

The Municipality of Kolding purchases IT-equipment under two framework agreements, one for computers and one for copiers, printers, faxes, and their combina-

tions. The municipality also leases IT-equipment. The total expenses for purchasing and leasing of IT-equipment in 2000 were slightly above 7 mio DKK (940.000 €). The expenses are further defined as illustrated in Table 5.

Product groups	Sub-group	Amount	Expense in mio DKK	Expense in EURO
Copiers	Leasing	?	1.25	168.000
Copiers, faxes	Purchasing	?	0.61	82.000
Printers	Purchasing	71	0.38	51.000
Computers – purchase	Conventional	165	0.59	79.300
	Portable	28	1.67	224.500
Monitors		173	0.73	98.100
IT-equipment leasing	Not specified	?	1.79	240.600
Terminals		11	0.04	5.200

Table 5. Purchase and leasing of IT-equipment in Kolding in 2000.

An environmental questionnaire has been developed for copiers, printers, etc. The (almost) full wording of the questionnaire is presented in Appendix 1. The questionnaire primarily reflects the considerations taken when establishing the criteria in the Nordic eco-label scheme The Swan, i.e. the product related questions focus on energy consumption, the use and content of substances that are hazardous to the environment or human health, and disposal of discarded machinery.

The questionnaire has different levels of detail. If the one accepting the tender can answer yes to the questions about the products having an official eco-label or en-

ergy label, no more product-related answers are requested. If not, a broad range of environmental issues are addressed in the remaining more than 30 questions. Obviously, it is less resource demanding for the supplier to answer only the first two questions and this is seen as another incentive to make products that are compliant with the requirements in official labelling schemes.

In the following Box an example of how the tendering procedure is conducted in the Municipality of Kolding is presented.

Box**Integration of environmental aspects in the framework agreement for IT-equipment**

Following a pre-qualification round, four tenderers were invited to bid for the tender. They all received detailed information about the requirements of the Municipality including the environmental questionnaire.

Twelve aspects were included in the determination of the best offer. Each of the aspects was assigned a maximum score of 4 points, but different weights were assigned to the aspects as seen below:

Price	20%	Guaranty	8%	Delivery terms	2%
Economy	20%	Environment	8%	Distribution	2%
Quality	10%	Assortment	8%	Aesthetics	2%
Service	10%	Technical value	8%	Functionality	2%

The tenderers all returned the requested information. For the environmental questionnaires all tenderers gave detailed answers including a description of their environmental policy as well as of the products offered.

The detailed answers mean that no tenderer was able to supply a product range where all products had been awarded an eco-label or an energy label. Therefore, the number of positive answers were counted in order to rank the bids with respect to environmental properties. The following results were obtained with respect to the evaluation of environmental aspects:

	No. of "Yes"	% of "Yes"	Score	Weighted score – environment	Total score – all aspects
Supplier No. 1	20	56	3	0.24	2.52
Supplier No. 2	17	47	2	0.16	3.18
Supplier No. 3	11	31	1	0.08	2.12
Supplier No. 4	27	75	4	0.32	3.72

When the scoring of all aspects was done it turned out that Supplier No. 4 had provided the best overall offer. The environmental aspects of his products were – by coincidence (?) – also the best, although the environmental score was not decisive in the overall evaluation.

The final decision regarding purchasing of specific products lies however still with the purchaser. The framework agreement offers a broad range of products and it is up to the single department to choose the product that best fulfils the actual needs. Here, it will often be possible to choose a product with good environmental specification, e.g. low energy consumption in different modes and duplex copying, and thereby secure that the environmental impacts are as low as possible.

5.6 Lorries and diesel

The purchasing of lorries (vehicles > 3.5 ton) is decentralised in Kolding and it is not possible to calculate the overall expenses for this product group. The following Table 6 gives examples of lorry purchases done in 2000:

Application	Price in DKK	Price in Euro
Lorries for refuse collection	2,100,000	280,000
Lorry for refuse collection (special test model)	213,000	29,000
Service cars – Civil Defence	654,000	88,000
Service cars – Road Department	431,000	58,000

Table 6. Purchase of lorries and cars in Kolding in 2000. Please observe that the overview is not complete.

Obviously, the purchase of lorries plays an important role in the budget of the Municipality. It also has an impact on the environment as indicated in the description of the purchase of person transport services.

As there is no framework agreement regarding the purchase of larger vehicles, the purchasing unit in the Municipality of Kolding does not have the possibility of adding environmental considerations to the purchases done in other departments. However, at the frequent meetings between decentral purchasers, the Department of Logistics and the Environmental Department, it is possible to discuss the environmental aspects of purchasing outside the framework agreements.

With respect to the purchase of diesel and petrol the Municipality has a framework agreement with a single supplier. The delivery is done to a central institution in the

Municipality where all municipal vehicles do the tanking. At the same time, registration of who carries out the tanking and what the counter (odometer) is showing occurs. As there are no differences between the fuel products offered by different suppliers, no environmental considerations have been taken into account during the negotiation of the agreement. The green purchasing efforts are directed towards the users of the framework agreements, e.g. that users of service cars shall use lead-free gasoline or low-sulphur diesel. The behaviour of the employees should in other words be similar to that required of private contractors supplying services that are equal in environmental impacts (see section 5.11 for more detail).

5.7 Medical care products

The municipality of Kolding purchased medical care products for an amount of 7,5 mio DKK (about 1.000.000 €) in 2000. Medical care products comprise of a large variety of single products ranging from napkins for children and the elderly, incontinent persons over breast prostheses and elastic stockings to orthopaedic footwear and products for treatment of diabetes.

Several framework agreements have been established and environmental considerations have been integrated into most of these. Due to the large variation in the products, specific environmental criteria have to be established for each product group with emphasis put on specific as well as general considerations with respect to the products, as well as the packaging and the supplier. The product group Orthopaedic footwear is an example of an area where it was not possible to find a supplier fulfilling the environmental demands. To

secure a continuous supply it was chosen to prolong the existing contract and await the development on the market.

For napkins the product emphasis is put on the same issues as in the Nordic eco-label, The Swan, e.g.

- No use of hazardous substances (e.g. no chlorine for bleaching, no use of substances from the Danish EPA list of hazardous substances, pigments and dyestuffs without heavy metals)
- No use of optical brighteners, perfume, or moisturisers
- Odour-neutralising agents are added in amounts less than 5%
- Plastics in the napkins are at least 70% biodegradable according to OECD-tests. Alternatively, only 190 g/m² is used
- No use of PVC or other chlorine-containing plastics

For breast prostheses and their accessories the main concern is safety for the users, i.e. they must be tested negative for allergenic properties. There are also specific considerations with respect to the materials and chemicals used in the production, e.g.

- Chemicals that are classified as hazardous to the environment must only be used in amounts of less than 1% of the total consumption for single chemicals and 2% in total
- Carcinogenic chemicals must only be used in amounts less than 0.1% of the total consumption of chemicals
- No substances from the Danish EPA list of unwanted substances must be used

For elastic stockings, corsets, and bandages emphasis is put on the production of natural and synthetic fibres. A large variety of fibres with different types on environmental impacts can be used and the envi-

ronmental questionnaires pinpoint some of the most important aspects:

- Avoidance of heavy metals in the production
- Avoidance of PVC and other chlorine-containing plastics
- Avoidance of chemicals that shall be classified as dangerous to the environment (single substances less than 1% of the total consumption, overall consumption less than 2%)
- Avoidance of chemicals from the list of undesirable substances published by the Danish EPA
- Content of pesticides in natural fibres less than 10 microgram/kg raw fibre

In the case of footwear, the main focus is on the production of leather. A very large number of chemicals can be used in the production and most of these can eventually end in the effluent from the production. The environmental questionnaire therefore addresses the use of chemicals in a similar manner as for fibres but additional questions regarding emissions of COD, BOD, VOC, chlorides, sulphides, and chromium from the production processes. Other questions regard the use of readily biodegradable and non-bioaccumulating detergents, avoidance of azo-colorants, minimisation of water consumption, and handling of waste from the production process.

For the footwear itself, the questions asked regard avoidance of PVC, use of water-based glues, emissions of nickel, concentrations of heavy metals in the finished product (less than 10 ppm), presence of formaldehyde (less than 150 ppm), and life time/reparability of the product.

For the mentioned products, as well as products in other framework agreements, there are also considerations regarding their packaging, e.g. it is preferred that

- The packaging can be returned to the supplier
- There are no heavy metals in packaging or printing materials
- No PVC is used
- Cardboard packaging contains at least 80% post-consumer waste

Finally, the environmental considerations also include the producer, e.g. by preferring suppliers with an environmental management system, a policy for waste management and distribution, and who fulfil all legal requirements with respect to environmental interventions.

By establishing and using environmental questionnaires for the products in the group “Medical care products”, Kolding primarily aims at purchasing products that are safe for their users. The broad range of questions also secures that the impact on the local environment from the emission of hazardous substances is avoided as far as possible, and that waste streams are recycled. In this context it does not matter where the reduction in environmental impacts takes place during the lifecycle of the product.

5.8 Office furniture

Office furniture is a product group that encompasses very different products, e.g. different types of tables, chairs, and shelves. The purchasing of furniture in the Municipality of Kolding varies considerably from one year to the other. As an example, purchasing of furniture amounted to 2.5 mio DKK in 2001 while in 1996 a leasing agreement for school furniture alone amounted to 4.1 mio DKK for a six-year period. In general, the purchase of furniture will be covered by a framework agreement with a single supplier. The supplier is selected on the basis of several award criteria where the environment was assessed on par with price, quality, level of service, delivery terms, etc., using a point system.

Because of the diversity of products within the overall product group it is relevant to address a large number of potential environmental impacts in the demand specifications. In the last tendering procedure priority was given to products fulfilling the criteria in the Nordic and the German eco-label schemes. If these were not fulfilled then potential suppliers should answer questions on the following issues:

- Resource conservation and whether the product can be recycled (e.g. wood from sustainable forestry, use of recycled materials, reparability and spare parts, use of renewable resources, recyclable packaging, long life time).
- Avoidance of hazardous substances (e.g. organic solvents, chlorine, heavy metals, plasticisers, CFC, only plain soap for cleaning)
- Environmental policies of the supplier (EMAS or ISO14001 certification, public strategy for resource consumption, environmentally friendly distribution, waste policy regarding source separation)

By encouraging products with an eco-label the Municipality of Kolding stimulates suppliers to develop and market products with good environmental properties. The users will not see the eco-label but hopefully they will enjoy using products with excellent environmental and technical properties.

5.9 Office material

The Municipality of Kolding purchased office materials for 2.1 mio DKK (282.000 €) in 2000. The product group includes binders, calendars, pre-printed forms, enveloped, pens, pencils, correction fluid, archive boxes, cassettes, etc. It is thus an example of a product group where a large number of products are purchased at a “low” price per product, thereby constituting in total a significant expense for the Municipality. It should however be observed

that the service and maintenance of copiers and printers are also included in the overall expenses. The amount used for this is unknown

The heterogeneity of the product group has caused three different environmental questionnaires to be developed, i.e. one for writing instruments, one for binders and calendars, and one for folders, boxes, etc. Each of these must be answered although there are some aspects that are common to all products within the product groups.

The common aspects regard the following:

- Avoidance of PVC in products and packaging
- Avoidance of heavy metals
- Avoidance of chlorine for bleaching of paper and cardboard in products and packaging
- Recyclability of packaging
- Producers have implemented an environmental management system
- Availability of a green account for the producer
- Existence of policies for waste management and distribution

For cassettes and boxes the questionnaire also includes questions on the use of 100% recycled fibres for cardboard boxes and avoidance of glues based on organic solvents.

In regards to writing instruments, questions additionally focus on the re-use and recycling possibilities of the products, e.g. re-fillable ink cartridges. They also focus on avoidance of organic solvents in inks, glues, and correction fluids.

The environmental questionnaires thus aim at reducing a number of potential environmental impacts, e.g.

- A reduction in resource consumption through re-use and recycling of products and packaging
- A reduction in photochemical ozone formation through avoidance of organic solvents
- A reduction in the health impacts of the users through avoidance of organic solvents and heavy metals in the products

5.10 Paper

Many different types of writing paper are used in the Municipality of Kolding. Purchasing of white paper for copying and printing amounted to about 1.100.000 DKK (app. 150.000 €) in 2000. Finished paper products like brochures are bought decentrally. The expense for this is unknown and it has thus not been possible to create a full overview of the actual amounts of paper being consumed by the administration of the Municipality.

The environmental impacts from production, use and disposal of paper have been focused on for many years in the Municipality of Kolding and also in general. Most suppliers of the Danish market have experienced this through requirements from private and public purchasers as well as private consumers. Likewise, some of the first efforts in both the Nordic and EU eco-labelling schemes were directed at writing and copying paper. Kolding has used these efforts in their framework agreements for different paper products. Environmental questionnaires have been established for:

- Copy and printing paper
- Forms
- Envelopes
- Copying services

An overview of the content in the questionnaires is presented in the following paragraphs. As mentioned they are closely related to the requirements in eco-labelling

schemes. As both the Nordic and the EU eco-labels have been revised recently, the questionnaires are to some extent outdated and will most probably be reformulated when new framework agreements are to be established.

The questionnaires for copy and printing paper, forms, and envelopes are rather similar being divided into three sections regarding general questions, environmental aspects related to the product, and environmental aspects related to the packaging.

The general part of the questionnaire addresses the environmental policies of the supplier, e.g. in regards to having a certified environmental management system, producing green accounts, and having distribution and waste management policies.

The questions regarding the product focus on a broad range of impacts that can be avoided or minimised by choosing an environmentally preferable product. Obviously, a supplier with an eco-label license can give a positive answer to most or all of the questions securing a good score on environmental performance. If a supplier does not have an eco-label license he must answer each of the questions and provide sufficient documentation for positive answers. For all the mentioned products the following questions apply:

- Is recycled paper used in the production? (state amount)
- Is wood used for production of paper from forests with a certified management system?
- Is CMTF-paper produced without the use of substances from the Danish list of undesirable substances?
- Is paper bleached without use of chlorine? (or state the content)
- Is water used in production re-circulated or completely cleaned?

- Are chemicals used for pulp production reused?
- Are biocides biodegradable and do not bioaccumulate?
- Are surface-active agents used for de-inking of recycled fibres readily biodegradable?
- Are printing inks (e.g. in logos and on packaging) without heavy metal compounds and chemicals from the Danish list of undesirable substances?
- Is the paper suitable for recycling?

For the packaging of the paper products the supplier is asked whether the packaging contains chlorine (e.g. PVC or chlorine-bleached paper), if the packaging is made of recycled and recyclable materials, and if it can be returned to the supplier.

Copying services are distinct in relation to the environmental questionnaires because several printing processes can be applied. Therefore, apart from the paper-related questions, there are firstly additional sets of general questions that must be answered, e.g.:

- Is the total content of heavy metals (lead, cadmium, mercury and chromium (VI)) less than 100 ppm?
- Is the amount of chemicals that is or should be classified as dangerous to the environment less than 2%?
- Are phthalates used?
- Are chlorine-containing plastics used?
- Are water-based glues used in lamination?
- Is water-based lacquer used for coating?
- Are repro chemicals and moisturised water collected and re-circulated?

Finally there is a set of specific questions relating to each printing method. The questions regard e.g. developers (are they water-based; are they recycled), consumption and composition of cleaning agents, emissions of VOC, recycling of electronic components in digital printing, recycling, or re-

use of toner and ink cartridges, and emissions of chromium, copper and toluene (in deep printing).

As for all other environmental questionnaires used in the Municipality of Kolding, the more positive answers a supplier can provide, the better. There are however some questions that must be answered with a yes in order for the product to be considered as environmentally benign. This especially concerns questions relating to the environmental properties of the chemicals used. By placing more importance on these questions Kolding aims at securing a high environmental standard in the production and at avoiding pollution of the aquatic environment including drinking water resources. Another focus area for the questions is in the avoidance of waste generation, both at the suppliers' side and following use of the products.

5.11 Person transport

The Municipality of Kolding purchases transport of persons in several ways; this is a significant expense for the Municipality and also constitutes a significant impact on the environment. On the global level the environment is affected through the use of fossil fuels and by emissions of carbon dioxide contributing to global warming. On the regional level, emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) increase the formation of photochemical ozone (smog), and on the local level emissions of NO_x, VOC, and particles affect human health.

The largest expense regards the participation of the joint public transportation company (VAT) in the County of Vejle, together with other municipalities such as Horsens, Vejle, and Fredericia. VAT operates six local routes in Kolding and five regional routes with departure from Kolding with about four million passengers every year in total. All routes are contracted to private

companies and Kolding subsidises the routes through an annual contribution to VAT. In 2000 the contribution was about 10 mio DKK (about 1.37 mio €). Additionally, there were costs for site rental, maintenance of shelters, toilets and water, and electricity for about 1 mio DKK (130.000 €).

VAT has as one of its main goals, to offer public transportation that within the given economic framework fulfils the transportation needs of the people living in the county. It is an additional goal that the need be fulfilled with minimal use of resources and as environmentally friendly as possible. A consequence of this may be that sparsely populated areas will have fewer connections while more densely populated areas where the need is bigger will have more frequent departures.

The Municipality of Kolding does not have any direct influence on the contractual agreements between VAT and the suppliers of public transportation, neither with respect to the economy nor the environment. The environment is however a central issue in the development strategy of VAT. Already in 1999 it was discussed whether it should be a requirement that all busses should be equipped with particle filters, but lack of standards for this postponed the decision. In 2000 all busses in Kolding were equipped with suitable CRT-filters (Catalytic Reduction Technology) and in the tender for 2001 it is a requirement that all urban busses have CRT-filters. For the regional busses driving in sparsely populated areas it was assessed that a greater reduction in environmental impacts could be achieved by using smaller busses instead of installing expensive particle filters. The efforts were therefore mainly directed at adjusting the capacity to the needs.

Purchasing of transportation of school pupils and handicapped and elderly persons is another main expense, amounting to 4.4 mio DKK in 2000 (about 600.000 €). Pur-

chasing or leasing of person cars is probably also a main expense, but it is not possible to create an overview of this because the decisions are made de-centrally.

An environmental questionnaire has been developed for framework agreements between the Municipality and companies offering driving services both regarding persons and goods. Like most other environmental questionnaires from the Municipality of Kolding it contains questions regarding the company as well as the product or service.

With respect to the company, it is regarded as positive, for example, if the company has implemented an environmental management system (EMAS or ISO 14001), publishes a green account, has a waste management policy, and a policy that secures resource efficient driving.

With respect to the “product” the questions are aimed at the vehicles and the fuels/accessories used for these:

- Are vehicles with the lowest possible fuel consumption per kilometre used for a given service?
- Are the vehicles equipped with a catalyst or a particle filter?
- If diesel is used as a fuel then the sulphur content is less than 0.05%?
- If petrol is used as a fuel then “green petrol” with a low content of aromatics, benzene, and olefins is used?
- Are all oils and lubricants vegetable and biodegradable?
- Are all hydraulic oils biodegradable according to OECD tests?
- Are used oil, oil filters, and their packaging collected and handed over to approved companies for further treatment?
- Are standard tyres used and is the tyre pressure checked regularly?
- Is the washing of vehicles done in places with a firm surface, a sand layer

beneath, and equipment for separation of oil?

- Are vehicles parked in places with a firm surface and equipment for separation of oil?
- Are used vehicles handed over to approved car breakers?

By choosing a supplier that can answer yes to as many of these questions as possible the Municipality of Kolding decreases the potential impacts from driving to some extent.

5.12 Tissue paper (or wipe-papers)

The Municipality of Kolding purchased tissue paper for cleaning purposes for about 200.000 DKK in 2000. The economic importance is relatively low but the products are used by a large number of employees and citizens.

As for most other buying areas the product group is covered by a framework agreement with a single supplier. The supplier is selected on the basis of several award criteria where the environment was assessed on par with price, quality, level of service, delivery terms, etc, using a point system.

The production, use, and disposal of paper (and tissue paper) are associated with a range of potential environmental impacts. Some of these become significant because most producers have a very large production at their facilities, and others because unwanted chemicals are distributed with the final product.

The Municipality of Kolding has established a set of demand specifications for tissue paper that is used in tendering processes. The specifications are primarily based on the Nordic eco-labelling criteria and if the product fulfils these criteria the supplier is then only required to answer this question together with providing the proper docu-

mentation. If the product does not fulfil the criteria the supplier must answer fifteen questions on specific issues. The most important of these are given below:

- No use of hazardous substances (e.g. no chlorine for bleaching, no use of substances from the Danish EPA list of hazardous substances, pigments and dyestuffs without heavy metals, biocides are fully biodegradable)
- Recycling efforts (content of post-consumer waste, re-circulation of production waste water, re-use of chemicals for cooking of paper mass, source separation of waste at the producer's, recyclable packaging)
- Resource conservation (wood from forests with sustainable production)
- Environmental management and green accounts at the producer (and supplier)

By giving preference to tissue paper with the Swan-label, Kolding contributes to the visibility of the label and thereby encourages its citizens also to choose eco-labelled products. For the environment the choice of eco-labelled products means a decrease in the use and emission of substances that can have unwanted impacts on the environment, which concern the producer as well as on the European scale. It also means that wood material from certified forest areas and post-consumer waste is the preferred raw material and that unnecessary consumption of energy and resources are avoided.

5.13 Other product groups

Not all product groups selected for closer examination in the RELIEF project have been addressed in detail in the previous sections.

The main reason for this is that some of the product groups are integrated into other groups. This is for example the case with floor coverings, partition walls and doors,

white goods and indoor lighting where the purchase of these products are integrated into the purchase of new buildings and the renovation of old buildings. These products are therefore subject to the considerations described for the product group "Buildings". Another example is the product group "Printing services" that has been addressed together with "Paper". Although an environmental questionnaire has been developed for Printing services almost all purchases are done de-centrally and it is not possible to specify neither the financial importance nor the extent to which the environmental considerations have been integrated in the de-central purchases. A separate framework agreement for Printing services will be in function from 2002 and will probably create a better overview of both the financial and environmental aspects for this product group

Another reason is that no framework agreements have been made for some of the product groups and accordingly no environmental considerations have been made in the purchases of the specific products. This is for example the case for pest management. Here, a framework agreement is being established in cooperation with five other municipalities in the region. Environmental considerations will be integrated into this agreement as in all others and the agreement will become effective in 2002.

6. Concluding remarks

The report shows that the Municipality of Kolding has come a long way in integrating environmental considerations into its purchasing activities. By the end of 2001 tenders for all framework agreements will include an assessment of environmental aspects on par with the more common aspects like price, quality, service, etc.

There is however one remaining question that has not been addressed in the report:

To which extent do the de-central purchasers actually utilise the possibilities for purchasing of green products within the framework agreements? This knowledge is essential if the current and future efforts in green purchasing should have their full effects, the most important aspect being that the Department of Logistics can identify areas where education of de-central purchasers in green purchasing of specific product groups may be required.

It is not possible at the moment to deduct this from the information available in the public accounting system. The Municipality will therefore investigate the possibility of having electronic registration of green purchases. This will be done in co-operation with the Danish Environmental Protection Agency and other Danish Municipalities.

The framework agreements are being renewed regularly by new tendering procedures. The environmental demands will also in the future form an integral part of this. The environmental demands may be subject to changes along with other purchasing criteria, and it is thus possible to include new environmental aspects that may have been more or less overlooked and neglected in the current agreements. It is also possible to emphasise the importance of certain criteria. This is for example the case with computers and copiers, where the RELIEF project has developed tools that can calculate the difference in environmental impacts between specific products, taking the actual pattern of usage into account. At the same time, the tool indicates the economic savings that can be obtained by the "right" purchase.

The Municipality also integrates environmental considerations into areas where purchasing is done outside framework agreements. The most important area is the building sector where the Municipality prepares environmental assessments of the most important building materials along

with considerations of energy and water consumption throughout the lifetime of the building. These efforts have been monitored for existing and new buildings for several years and the results show that Kolding has already come a long way in reaching the target reductions for 2005.

Appendix A – Example of an environmental questionnaire

Environmental questionnaire for Copying Machines, Printers, Fax and their combinations

General questions

Must always be answered.

	Yes	No
The product applies to criteria set by The Nordic Swan, the EU-Flower or the German Blaue Engel, if such products are available on the market?		
The product applies to criteria set by Energy Star or Energy 2000?		
Is the supplier certified according to ISO 14001 or registered according to EMAS?		
Does the supplier have a waste policy?		
Does the supplier have a policy of transport in the intention of reducing the impact of CO ₂ ?		

If Yes to question 1 and 2 no further questions. If no to question 1 and 2 the following questions have to be answered too:

Environment

Impact from substances

	Yes	No
Used plastic parts ² are without cadmium and lead?		
Used plastic parts is made of one type of plastic only?		
Used plastic parts can be reused?		
Used plastic parts bigger than 25g are without PVC?		
Used flame inhibitors are without bromide organic compounds ³ or chlorine containing paraffin?		
If batteries are used, is the content of heavy metals then below the following values; lead 15 ppm, cadmium 10 ppm, mercury 10 ppm (weight)?		
Chemicals in used ink or dyes are, if classified as environmental dangerous ⁴ , either a) for single compounds below 1% of the total content of chemicals or b) totally below 2% of the total content of chemicals?		
Chemicals in used ink or dyes are, if they are classified as possible carcinogenic ⁵ or are suspected carcinogenic ⁶ , below 1% of the total content of chemicals?		
The content of volatile organic solvents in used inks or dyes is below 5% (weight)?		

² The term plastic parts is referring to parts bigger than 25g

³ Fore example. polybromided biphenyles; PBB and PBDE or tetrabromine bisphenol-A, TBBPA

⁴ Classified according to EU's directive no 67/548/EEC, appendix 1, latest changed through directive no 93/101/EC of November 11th, 1993

⁵ Classified according to EU's directive no 67/548/EEC, appendix 1, latest changed through directive no 93/101/EC of November 11th, 1993

⁶ According to IARC (International Agency for Research on Cancer; Groups 1A og 2A or according to ETAD (Ecological and Toxilogical Association of Dyestuff Manufacturing Industries)

	Yes	No
The electronic parts are produced without use of ozone layer depleting substances ⁷ ?		

Environmental impacts from use

	Yes	No
The machines ⁸ are capable for using Eco-labelled paper?		
The machines are capable for recycled paper?		
The machines capable for printing and copying on both sides of the paper?		
The emission of ozone is below 0,02 mg/m ³ ?		
The concentration of dust is below 0,15 mg/m ³ ?		
Do the machines have an energy saving function which automatically starts after a period of transition?		
The period of transition can be adjusted by the user?		
The energy consumption per printed, copied or faxed page is below 3W?		
The noise level from the machines at maximum load is below 55 dB(A)?		
A comprehensive manual in Danish comes along with the machines?		
Cartridges for inks and dyes can either be reused or refilled?		
The machines are assembled in a way so single parts easily can be separated without use of special tools ⁹ ?		
The machines last longer than similar machines with normal use and maintenance?		

Environmental impacts from disposal

	Yes	No
Can the machines' single parts be reused?		
Can used and worn-out equipment be returned?		
If the machines or their single parts cannot be returned, is an environmental correct way of disposal then distinctly stated in Danish?		

Packaging

	Yes	No
Carton used for packing consists of at least 80% reused materials?		
Plastic used for packaging is without PVC?		
The packaging can be returned?		
Dyes on the packaging are without heavy metals or heavy metal containing substances?		
The packaging is produced without use of ozone layer down depleting substances?		

⁷ CFC, HCFC, ethane trichloride or carbon tetrachloride

⁸ Copying Machines, Printers, Fax and their combinations

⁹ By special tools is referring to tools which are not usually available for non professionals.