



E U - R e s e a r c h P r o j e c t

RELIEF

STATUS REPORT

Environmentally Favourable Procurement in the City of Zurich

Final Report

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Summary

Zurich is one of six cities working together with seven scientific partners on the European RELIEF Project. It is the aim of the RELIEF Project to find out what influence public procurement has with regard to the development and spread of green products.

The City of Zurich began already in 1987 a programme on green procurement in public administration (Chapter 4). After the intensive, initial activities which produced good results, this centrally directed programme was continued at a lower level and, later, the activities concerned with green procurement were integrated in the endeavours to introduce environmental management systems. In 1997 the City Council of Zurich decided on the decentralised organised introduction of environmental management systems at board/office level. In the meantime, there is a certificated environmental management system in the first administration units.

Within the framework of the Status Reports, the financial significance of the individual product groups on the RELIEF product list (e. g. cleaning materials, energy, foodstuffs, IT products, building and construction, office materials) was investigated, as well as the present situation with regard to the green procurement of these products (Chapters 5 and 6). This was achieved by direct questions being put to those responsible for procurement in the administration of Zurich. Of the expenses incurred for procurement for the City of Zurich in the year 2000, forty percent of the procurement could be assigned to the product groups examined. The expenses incurred for the renovation of buildings and for new constructions form, as might be expected, the greatest share. Already the investigation within the product groups provided the first indication of the potential relevant for environmental relief. For example, when a high voltage switching device is required, a considerable potential for environmental relief in connection with the greenhouse effects can be realised by the selection made of a product or, respectively, the development of a product. The environmental relief potentials were also ascertained in connection with the cleaning of public transport vehicles according to need, as well as the use of modern technology to clean buildings.

The analysis of hurdles shows that a greater demand on the part of the user as a prerequisite for the increased procurement of green products, a legal position which is unclear, unused possibilities to include environmental criteria in decisions on procurement, varying viewpoints on different levels within the local authorities, the non-availability of green alternatives on the procurement market, the additional work required to take environmental criteria into consideration in the procurement processes, the subsequent costs which are not taken into account when decisions on procurement are made, and the difficulty in identifying green products on the procurement market are observed as being the greatest hurdles in Zurich.

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1 Introduction

Zurich belongs to a group of six European cities which are participating in the research project “RELIEF”.

This project is funded under the 5th Framework Programme of the European Commission and the full title is “*Environmental Relief Potential of Urban Action on Avoidance and Detoxification of Waste Streams Through Green Procurement*”. Although in the past years an increase in the awareness of environmental problems is to be noted, it is astonishing how little this has influenced the process of procurement in the development and marketing of green products. Yet it is exactly public procurement that could and should be exemplary and show the way to help green products to a break-through on the market.

It is therefore the aim of the RELIEF Project to examine the possibilities and the influence of the public purchaser with regard to the development and distribution of green products. Besides this, the basis for judging the potential for environmental relief by means of public procurement on the European level will be worked out in this project.

The purpose of the status reports on green procurement in the individual cities is two-fold:

First of all, a survey should be made of the procurement process as practised, and especially of green procurement, in the individual cities. In the process of this survey, the analysis within their own administration should provide, on the one hand, those responsible with the possibility to recognise undesirable developments or unused potentials within their own strategies, and also for working out suitable measures for the further development of green procurement. On the other hand, the status reports on the other cities participating in this project offer those responsible for procurement the possibility of an insight into other strategies concerning green procurement, and this will undoubtedly lead to new ideas and concepts for improvements within their own strategies.

Then, secondly, the analysis of the procurement process as practised in the cities will also provide valuable data for further work in the RELIEF project. In this way the status reports will investigate and show what is the financial significance of different products or groups of products within the framework of urban procurement.

Furthermore, the analysis of hurdles, based similarly on purchaser interviews, should also provide information concerning the most significant hurdles which stand in the way of green procurement. Therefore, the objective of the analysis of hurdles has to be to identify the individual hurdles and to determine their relevance. Then, taking this as a basis, strategies to overcome these hurdles can be developed.

2 Introducing Zurich; the partner city

2.1 Geography

The City of Zurich lies at the head of Lake Zurich in the Canton of the same name. The deepest point of the city is 392 metres above sea level, while the local mountain, Uetliberg Kulm, rises to 871 metres above sea level (www.stadt-zuerich.ch).

The area of the urban region including all land and water surfaces is just 92 km². Of this area, 50 km² are a settlement area.

Table 1 Size and division of the urban area

	km ²	%
Area of site of building	10,69	11,6
Surroundings and grounds/facilities such as courtyards, gardens, storage yards, cemeteries, sports grounds, swimming baths, recreational parks	26,61	29,0
Streets, squares (incl. parking lots), railway precincts	12,51	13,6
Meadows, fields	14,50	15,8
Woodland	21,90	23,8
Rivers, lakes	5,46	5,9
Remaining areas such as gravel and clay pits, sewage plants, water reservoirs, embankments etc.	0,22	0,2
Total area	91,88	100,0

The city of Zurich is divided into twelve circles which are subdivided into a total of 34 quarters

Source: http://www.stadt-zuerich.ch/stat_amt/uebersichtsTable/stadtgebiet/groesse.htm

2.2 Economy and population

Having a residential population of around 360,000 persons, Zurich is the largest city in Switzerland. At the same time, being the most important place for manufacture, trade and finance, it is also the economic centre of the country. Approximately one out of nine Swiss Francs produced in the Swiss economy is generated in Zurich.

Table 2 Development of the residential population

Year	Inhabitants	Year	Inhabitants
1970	422,640	1995	360,826
1980	369,522	2000	360,980
1990	365,043	2001*	363,243

* June 2001

Source: http://www.stadt-zuerich.ch/stat_amt/uebersichtstabelle/bevoelkerungsbestand/entwicklung.htm

More than 25,000 businesses in the secondary and tertiary economic sectors (i. e. industry, trade and services) are established in Zurich. These offer around 315,000 persons employment (fully or part-time employed, figures for 1998). The ratio “number of employment posts (full and part-time) to the number of residential inhabitants” is thus approximately 1:1.

In the year 2000, the City of Zurich earned an added valuation of 46 billion CHF (29 billion €). The economically most important branch is the finance sector (banks, insurance companies etc.) with an added valuation share of more than one third. Similarly, a substantial share (one fifth) is earned by services related to enterprises and

¹ Calculation factor: 1 CHF=0.636 €(Three year average from July 1998 to July 2001)

by services related to real estates (this includes e. g. advisory services for enterprises, EDP services and real estate management). In comparison, the added value share of the secondary sector, (essentially: industry as well as building and construction), is merely 10 %.

2.3 Structure of the administration

The entire city administration of Zurich is subdivided into nine „Departements“. The City Council consists of nine members with full responsibility and authorisation to act officially. In the sense of a collegiate authority they form the executive. The City Council is elected according to the absolute majority principle. The Chair in the City Council is taken by that member who holds the office of the city president and in this function he is responsible for the general supervision of the entire city administration. Each of the nine City Councillors is responsible for a single „Departement“.

Figure 1 Simplified Organigram of the city administration in Zurich

Source: Zürich für Sie; Stadt Zürich (Hrsg.); S. 168, 169.

Besides the City Council as the executive, the Municipal Council acts as the legislative authority. The Municipal Council consists of 125 members who are elected in accordance with the proportional representation principle and with regard to the number of inhabitants in each of the twelve constituencies. Having around 22,500 employees (= 16,548 places of employment) the city administration belongs together with the Canton Zurich, the Post Service, the Swiss Federal Railways (SBB) and the large banks to the big “enterprises” in the City of Zurich. A working week has 42 hours. Thanks to the six annual business holidays there has been, since a few years now, what is practically a 41–hour week. At the end of 2000 there were approximately 12,400 full – time working places as compared with 11,100 part – time working places.

Table 3 Employment sectors of the urban employees in the year 2000

Works / Businesses	3,682	Education / Schools	1,519
Health (incl. ambulance)	3,641	Social (incl. Labour Exchange)	1,262
Administration in a narrower sense	3,185	Homes for the aged, children and juveniles	832
Police / Security	2,160	Culture / Sport / Leisure–time	267

Source: Personalamt der Stadt Zürich, 3.12.2001.

2.4 General Environmental Situation

In the past few years the environmental situation in the City of Zurich has, fortunately, improved in some ways. The pollution of rivers and lakes and of the air has decreased. Nevertheless, some problems have not been solved yet. For example, the matter of noise is becoming increasingly more critical. In the surroundings around the homes of 140,000 inhabitants of the City of Zurich, the legal limit for noise is being exceeded: for 120,000 of these inhabitants, the immission threshold value (residential areas by day 65 dB(A)/by night 50 dB(A)) and for the other 20,000 inhabitants, the alarm value (residential area by day 70 dB(A)/by night 65 dB(A)), are exceeded and thus the noise is unbearable.

Especially the increase in mobility, most of all the leisure-time and air traffic, brings with it an ever greater degree of noise pollution for the population and diminishes the quality of the air. Although the quality of the air has improved over the past few years, it is still too early to be complacent. Nitrogen oxide, fine dust and ozone are still a problem. The main cause is the road traffic. The immission threshold values are not being kept to. While nitrogen oxides are highly pollutant all the year round, ozone pollution reaches its peak in summer and the fine dust peak is in winter. Data on the quality of the air are brought up to date daily and are available in the Internet (<http://www.stadt-zuerich.ch/ugz>).

Table 4 Immission development of individual pollutants in the City of Zurich

(Measuring station Stampfenbachstrasse)	Threshold value ($\mu\text{g}/\text{m}^3$)	1990 ($\mu\text{g}/\text{m}^3$)	1995 ($\mu\text{g}/\text{m}^3$)	2000 ($\mu\text{g}/\text{m}^3$)
Sulphur dioxide	30 ¹	22	12	7
Nitrogen dioxide	30 ¹	57	42	38
Fine dust (PM10)	20 ¹	–	–	27
Ozone	120 ²	158 ³	211 ³	152 ³

(¹ = Annual average; ² = Hourly average; ³ = Number of times exceeded per year)

Source: Umwelt- und Gesundheitsschutz Zürich (UGZ); 2001

The current environmental situation of further fields such as, for example, settlements, energy, air, noise, water, waste, ground, Nature and landscapes, climate and electromagnetic pollution is presented in detail in the Environmental Report 2001 of the City of Zurich. (www.stadt-zuerich.ch/ugz/usf/umweltbericht2001).

3 Procurement in Zurich

3.1 General information

According to the public budget, in the year 2000 the total expenses of the City of Zurich amounted to 6,677 million CHF (that corresponds to approximately 4,247 million €). This includes the estimated sum for procurement activities amounting to 760 million CHF (i. e. approximately 483 million €) or 11,4 %. This value corresponds, in principle, also to the experience of the other cities in the RELIEF project, according to which the annual expenses for procurement activities make out around 10 % of the annual total expenses.

Figure 2 Percentage of the expenses relevant to procurement out of the total expenses in 2000

Source: Data from the Health and Environmental Protection „Departement“, Environmental Protection Board, own calculations, IFIP 2001

3.2 Green Procurement

Green procurement in Zurich has a long tradition. Because of changes in the structure of procurement, away from centralised to decentralised procurement, the opening of the markets in general, the introduction of environmental management systems, and changes in the structure of the administration, it is, however, rather difficult at present to gain a comprehensive overview of the current status of green procurement.

3.2.1 The beginnings of green procurement

Subsequent to the resolution of 01 .07. 1987, the City Council gave an assignment to a consulting company to carry out a project on “*Environmentally fair behaviour in the handling of substances and products in the city administration*”². It based this on the general obligation to be careful with substances which are a threat to the environment, and also on its own environmental policy principles on how to act (1. To encourage the elimination of the causes. 2. To think long-term and aware of the costs. 3. To act in an exemplary way in one’s own household.) The obligation to be careful was thus understood in the widest sense; the entire span of life has to be taken into consideration, from the initial exploitation of natural resources to the disposal of a manufactured product, as well as all kinds of water-, air- and ground pollution. The primary aim in this was to make the criterion “environmentally tolerable” a fix element in the procurement, utilisation and development of products.

² ger.: „Umweltgerechtes Verhalten im Umgang mit Stoffen und Produkten in der Stadtverwaltung“

Within the project, as sketched out, stock was taken of the ecological potential to save, as well as the appropriate measures which aim at economical use and careful dosage of materials. Unnecessary and harmful substances should not be used while the environmentally tolerable substitutes and alternative products should be encouraged. To spare resources and to avoid waste, materials should be recycled, and products with a long period of use should be given preference.

The structure of procurement in the City of Zurich was at that time, just as it is today, very complex – many products were purchased by centralised procurement but many others were purchased also by decentralised procurement. Of the 100 boards questioned in 1989, approximately 80 of them made purchases on their own responsibility, whereby a total of 350 boards were engaged in making purchases. Centralised purchasing agencies were the *School and Office Materials Administration*³, the *Street Inspection*⁴, the *Technical Services Board*⁵ (responsible for the cleaning of buildings) and, in a certain way, also the *Building and Construction Office*⁶ which purchases all the products needed specifically for construction as well as most of the fittings. In the field investigation at that time, a distinction was made between 10 different groups of materials.⁷ 40% of the total expenses of 230 million CHF (146 million €) went to the account of “materials specifically for the boards”. Approximately 10 % of the 230 million CHF was spent on “spare parts” and “building materials”. The product groups “vehicles and appliances”, “fittings”, “office materials” and “expendable items” each cost the accounts 5 % of the total expenses for material.

The result of the project was a list of 62 measures within the following procurement sectors:

- school and office materials,
- vehicle maintenance,
- road maintenance,
- maintenance of public land, parks
- cleaning of buildings,
- building and construction

In the **school and office materials** sector, fifteen measures in all were initiated, and special attention was given to environmental impact categories; the careful use of resources and the avoidance of waste, while emphasis was laid on paper and EDP material.

The five measures referring to the **vehicle maintenance** sector should have the effect of reducing especially emissions of solvents and water pollution.

3 ger.: Schul- und Büromaterialverwaltung

4 ger.: Straßeninspektorat

5 ger.: Amt für Technische Dienste

6 ger.: Hochbauamt

7	Construction materials	Office materials/office machines school and office materials administration
	Vehicles/appliances	Fittings
	Spare parts	Foodstuffs
	Expendable items	Expendable medical items
	Office materials/office machines	Product groups specific to the boards

For the **road maintenance** sector, nine measures in all should bring about improvements with regard to air pollution, solvent emissions, waste avoidance, the careful use of resources and emissions of heavy metals.

The eight measures for the maintenance of **public lands, parks** were concerned first and foremost with the reduction of toxic substances which end up mainly in the soil or in water.

For the sector concerned with **cleaning buildings**, fourteen measures were decided upon to be effective especially against water pollution (caused by harmful substances, residues and substances in cleaning materials which are toxic or not fully biodegradable) and to encourage the careful use of resources.

Eight further measures in the **building and construction** sector should, first and foremost, be positively effective on solvent emissions, CFC emissions, the careful use of resources (predominantly water and energy) as well as on heavy metal emissions.

The *Environment Protection Board*⁸ within the *Health and Environmental „Departement“*⁹ of the City of Zurich has been charged with the continual evaluation of the measures which have been decided on by the City Council. That should ensure the long-term and successful implementation of the measures.

Already in the first report (*“Environmentally fair behaviour in the handling of substances and products in the city administration – Control of success 1991/92”*¹⁰), reference could be made to the fact that within 3 years almost half of all the measures had been put into force. A genuine evaluation, in the sense that the effects on the environment (within the individual environmental impact categories) that could be thus avoided were calculated quantitatively or estimated, did not, however, take place. The control of success which was carried out did, however, lead the City Council to issue additional resolutions concerning the procurement of green products which go further for some of the measures which, for various reasons, proved difficult to implement. For example, in October 1991, on account of what had been revealed by the control of success, the City Council decided that, as recycling paper had not succeeded in catching on until then, despite the measures that had been decided upon, the use of recycled paper in the city administration of Zurich for all documents without permanent value was to be obligatory. The objective of this was that for 60 % of all documents grey recycled paper should be used. The success of this endeavour, recorded in the administration’s internal evaluation report of 1993/1994, was that, at that point in time, 42 % of the copy paper, 30 % of the printed matter, 72 % of the notice blocks, 95 % of the envelopes and 39 % of the school exercise books which were used were made of grey recycled paper.

3.2.2 From centralised to decentralised organisation of green procurement

The green procurement programme decided on by the City Council in 1987, and which was intended to reduce environmentally harmful substances, was organised centrally at first. This structure was appropriate for the start. Many objectives could be achieved

8 ger.: Umweltschutzfachstelle

9 ger.: Gesundheits- und Umweltdepartement

10 ger.: „Umweltgerechtes Verhalten im Umgang mit Stoffen und Produkten in der Stadtverwaltung – Erfolgskontrolle 1991/92“

within a short time. This is shown by the last comprehensive control of success for the year 1993/94, which was carried out by the *Environmental Protection Board*. After the beginning phase, however, it also showed that green procurement divided up very quickly into programmes specific to boards (e. g. ecological management of green open spaces, ecological assessment of cleaning materials, ecological building and construction). The centralised approach should therefore be replaced by another more appropriate approach which also encourages taking on independent responsibility.

With the intention of bringing about a further development of the programme of green procurement, the City Council decided in 1997 that the „Departements“ should establish independently an environmental management system according to ISO – Norm Nr. 14,001. As experience gained from the green procurement programme has shown, a decentralised organisation corresponds better to the actual structure of the city administrations than one which is centralised. The nine „Departements“ possess a high degree of independence, and, with regard to the field of action, need for action and competence to act, the difference between the 60 boards is very great. To guarantee cohesion within the city administration, and so to make sure the environmental programme corresponds to the environmental policy which was issued by the City Council in 1995, the internal environmental protection programme must be summarised in reports and be evaluated by the *Environmental Protection Board*. Green procurement is a part of the programme.

The transition to environmental management systems that is striven for could be carried out very well in the *Building and Construction Office*. The basis was formed by existing ecological efforts such as the “Programme to Restore the Buildings of the City of Zurich” (PRESANZ) which lasted from 1980 until 2000, and which provided a great variety of impulses in Switzerland for the rational use of energy and for the use of renewable energy, and also further guidelines for the ecological construction of buildings (see Chapter 4.6) by the office for sustainable construction. However, in the „Departement“s, the environmental management systems have not been introduced as yet in the scheduled framework. Only the *Building and Construction Office*, the *Electricity Works*¹¹ and the *Environmental Protection Board* have already received a certificate according to the ISO – Norm Nr. 14,001. A thorough and complete examination and direction of the environmental programme is therefore not possible at present. This will be carried out first when there is a broader participation of the relevant boards.

The *Environmental Protection Board* is active in the sector of green procurement at different levels. Within the Canton of Zurich it takes part in the cantonal panel of experts on green procurement. The *Environmental Protection Board* is also a founding member of the “Swiss Community of Interest for Green Procurement”¹² (IGÖB). In the year 2000, the IGÖB brought out the publications “Public procurement, a guide to sustainable procurement”¹³ and „Economic and environmentally conservation–

¹¹ ger.: Elektrizitätswerke Zürich (ezw)

¹² ger.: Schweizerischen Interessensgemeinschaft Ökologische Beschaffung

¹³ ger.: Öffentliche Beschaffung, Leitfaden für eine nachhaltige Beschaffung

conscious cleaning of buildings”¹⁴. As a member of ICLEI, exchange also within Europe is cultivated by the *Environmental Protection Board*.

3.2.3 Putting the “Local Agenda 21” into force

In a first step, the City of Zurich summarised the urban environmental policy in 1995 from the point of view of the Local Agenda 21. The result is the report “*Environmental policy of the city of Zurich – local agenda 21*”¹⁵. In this report the topic of urban procurement is given a complete chapter of its own, and it is stated firmly that „*the ecological direction taken by the urban procurement authorities should be encouraged further. As a minimal target it goes that at least the level achieved by the large private businesses can be taken on*”¹⁶ Furthermore, „*the green procurement programme on the subject of substances and products should be continually adapted to the best level*”¹⁷ (Environmental policy of the City of Zurich – Local Agenda 21, p. 17). This report forms also the framework for different actual implementations. For instance, within the project “*Zurich, fit for the future*”¹⁸ (www.stadt-zuerich.ch/fste/pro_lokale_agende.htm) the criteria of sustainability for the centralised purchase of foodstuffs were formulated for the first time.

14 ger.: Wirtschaftliche und umweltschonende Gebäudereinigung

15 ger.: „Umweltpolitik der Stadt Zürich – lokale Agenda 21”

16 ger.:“die beim städtischen Beschaffungswesen eingeschlagene ökologische Richtung weiter verstärkt werden soll. Als Minimalvorgabe gilt, dass der bei privaten Großbetrieben realisierte Stand zumindest eingestellt werden kann.”

17 ger.:“das ökologische Beschaffungsprogramm im Bereich Stoffe und Produkte [soll] laufend dem besten Stand angepasst werden”

18 “Zukunftsfähiges Zürich ”

4 Procurement of the products on the RELIEF product list in Zurich

The extent of expenses for the individual products/product groups in Zurich was based on the RELIEF products/product group list. Of the 28 products/product groups on this list, exact data for 14 products/product groups could be investigated in Zurich. No direct figures could be obtained for 5 other products/product groups because these particular products/product groups (floor covering, furniture, lighting, sanitary articles and white goods) are generally purchased by the *Building and Construction Office* within the scope of the construction and restoration of buildings, and thus these figures are included there. The annual expenditure for these product groups was estimated from the percent contribution they make to the total construction or, respectively, renovation costs from a mix of typical public buildings in Zurich.

In the end there were 9 products/product groups for which no data at all could be obtained, either because these products were of no importance in Zurich or the data on these products were not available in a form necessary for the investigation. Only one of these 9 products/product groups is, however, part of the 16 so-called core products. Consequently 8 of the products/product groups taken into account belong to those which the individual partner cities, from their respective points of view, consider worth investigating, and therefore put them on the products/product group list.

The total expenditure for the RELIEF products/product groups in Zurich amounts to around 188 million € i. e. around 4,4 % of the annual total budget or around 39 % of the means the City of Zurich yearly pays for procurement. These statements tend to express the lowest values because in many cases the total expenditure for a particular product/product group could not be obtained and, in such cases, the figure given must be taken as the least value.

In the following, the information obtained with regard to the expenditure situation of the individual products/product groups on the RELIEF list, as well as the present situation of green procurement in these products/product groups in Zurich will be summarised briefly.

4.1 Cleaning materials

The competence for the cleaning of buildings in Zurich is in the hands of the newly installed *Real Estate Management*¹⁹ (a board of the *Building and Construction „Departement“*²⁰), which has emerged from the merging of the *Technical Services Board* and parts of the *Building and Construction Office*. The new *Board for the Cleaning of Buildings*²¹ (which has overtaken this task since 01.09.2001 from the *Technical Services Board*) is responsible for the cleaning of administrative buildings, schools, businesses within schools and day nurseries, but not for hospitals. Of the total 2,400 buildings which are administrative property, approximately 50 % are cleaned by

¹⁹ ger.: Immobilien – Bewirtschaftung (IMMO)

²⁰ ger.: Hochbau Departement

²¹ ger.: Abteilung Gebäudereinigung

the board or their sub-contractors. The *Board for the Cleaning of Buildings* competes publicly with other private tenderers. The aim is to clean, as far as possible, all administrative buildings. However, they are able to compete only to a certain degree because the labour costs for the urban cleaning staff are plainly higher. The decision from the City Council whether, in future, the tenders are to be judged without the labour costs is overdue.

The tasks of the *Board for the Cleaning of Buildings* fit into two main groups. They are:

- the centralised procurement and sale of cleaning materials, and
- to carry out cleaning services in the public buildings or businesses of the City of Zurich

Of the total annual budget of 16 million CHF (approx. 10 million €) about 30 % is expended for cleaning materials, staff and for additional, hired cleaning services.

Annually around 410,000 CHF (260,760 €) are spent for cleaning materials (detergents, washing – powder, cleaning substances for floors, windows, carpets etc.) and 475,000 CHF (302,100 €) for cleaning materials (cleaning devices, cloths etc.).

For the cleaning agents, already in 1989 on the occasion of the above-mentioned City Council resolution, a study²² of the ecological assessment of cleaning agents was commissioned. The aim of this study was to judge the range of products at that time with regard to ecological aspects, with the objective of successively reducing the environmental pollution resulting from the use of cleaning agents, and to come to a range of alternative cleaning substances which pollute the environment less. The result of this study was the classification of the products as strongly, medium or slightly pollutant, which ultimately led to a today still valid catalogue of cleaning materials for the former *Technical Services Board*, in which, for each cleaning substance purchased and offered, the degree to which it is harmful for the environment is stated. Actual calculations of the reduction of environmental pollution as a consequence of the substitution of products, measured in the appropriate environmental impact categories, however, were not carried out.

Also the cleaning methods are continually being optimised ecologically. Through the widespread use of microfibre cloths for cleaning purposes, the consumption of cleaning agents could be greatly reduced. New are also the trials with CFT cloths (regenerate cellulose) which are currently being carried out. This cleaning material uses the quality of water in such an optimal way that it is possible to practically do the cleaning without any cleaning agent.

4.2 Energy

The statistics on the consumption of energy to heat all 4,500 public buildings are carried out by the *Building Technology Board*²³ a subdivision of the *Real Estate*

²² Kasser, U. Ökologische Beurteilung von gewerblichen Reinigungsmitteln, Methoden und Produktklassierung, Schlussbericht, Zürich 1991
and
Umweltschutzfachstelle (Hrsg.) Ökologische Beurteilung von Reinigungsmitteln, Aktualisierung der Methode, Zürich November 1994

²³ ger.: Abteilung Gebäudetechnik

Management. In the heating period of 1999/2000 (1st July 1999 until 30th June 2000) around 13.8 million CHF (8.8 million €) were spent. Approximately 2,400 of these buildings are *Administrative Property*²⁴, and the energy for heating is purchased centrally from the *Building Technology Board*. The remaining buildings belonging to *Finance Property*²⁵ as well as most of the urban businesses are not supplied by the *Building Technology Board*, although the possibility to exert influence does exist.

In general it can be noted that gas and district heating as sources of energy are being employed more and more. Oil as a source of energy is about to go into decline. District heating in Zurich is produced mainly from waste material. In both of the garbage incinerators in Zurich, around 276,500 tons of garbage were burned in the year 2000. Both of these incinerators are connected to the district heating network and, in 2000, they fed together 415,000,000 kWh into the network. Within the area of the districts supplied with district heating, it is obligatory to be connected to the network as far as that is economically acceptable.

Further to this, in 10 of the buildings belonging to *Administrative Property*, solar hot water plants are in use but, because their maintenance makes high demands, there is some doubt as to their efficiency. In general, the Building Technology Board wants, in future, to employ stronger photovoltaic elements instead of thermal solar elements in public buildings

At the moment, an assessment on the use of ecologically more advantageous sulphur-reduced fuel in all the buildings of the *Administrative Property* is carried out. While the estimated extra costs of procurement amount to around 50,000 CHF, the costs for service are less.

Especially in the heating sector, saving energy through the way buildings are constructed plays an essential role. This is aimed at by applying the MINERGIE – Standards (see Chapter 4.6).

Already in 1992, the City Council had passed the resolution on “Targets for the energy policy of the City of Zurich”. In this it is stated that „*Energy-saving measures are to be valued according to their cost-benefit relation*“²⁶. At the same time the leading group of the PRESANZ project provided the City Council with guidelines which should be used in the entire city administration to assess the economic value of energy-saving measures. The guidelines which the leading group of the PRESANZ project had begun to work out already in September 1982, use, as a calculation model, a dynamic annuity factor method in which the investment costs with an annuity factor are converted into annual capital costs and these are compared with the saving in operation costs on average over the period of time for amortisation. As these guidelines have, in principle, stood the test, they remain unchanged for the time being. Within the framework of the impulse programme RAVEL, supported by the examination of the external costs of energy supplies made by various federal departments, the *Federal Department for Energy Economy*²⁷ has subsequently issued a

24 ger.: Verwaltungsvermögen

25 ger.: Finanzvermögen

26 ger.: „Energiesparmaßnahmen aufgrund des Kosten – Nutzen – Verhältnisses zu beurteilen sind“

27 ger.: Bundesamt für Energiewirtschaft

“recommendation for calculations of the economic efficiency of energy with the inclusion of external costs. On account of this new basis, in 1998 the City Council adapted the guidelines for the calculation of the economic efficiency of energy-saving measures and, by means of a City Council resolution, declared them to be binding for city administration. To allow consideration of the external costs within the framework of the method of calculation, the following energy price supplements are to be added:

mineral oil: 4,5 Rp/kWh (0,028 €/kWh); natural gas: 3,0 Rp/kWh (0,019 €/kWh); wood: 1,5 Rp/kWh (0,01 €/kWh); electricity: 5,0 Rp/kWh (0,031 €/kWh); district heating: to be fixed according to the energy source mixture used.

4.3 Foodstuffs

The *Health and Environmental Protection „Departement“* purchases annually foodstuffs to the value of 20,2 million CHF (12,8 million €). These foodstuffs are purchased for 38 boards or institutions of the „Departement“ (hospitals, nursing homes, homes for the aged and the municipal kitchen) as well as the nursery schools of the city.

In Summer 1999 a part of the foodstuff procurement was, for the first time, put out to public tender (submission according to GATT/WTO). Within 11 product groups, 164 products were put to tender in an open procedure. These products cover about a third of the foodstuffs required. The only criterion for the acceptance of a tender was alone the price. The only demands made of the products were merely that they be usual in the trade and of impeccable quality.

In March 2001 a tender for foodstuffs was put out again for a second time amounting to around 7.2 million CHF, whereby, besides the economic aspect, to a great extent, demands on the product were also made with regard to sustainable development. The following criteria determining the decision whether to purchase or not were, among others;

- the reduction of tins,
- healthy products,
- products from animals kept under ideal conditions,
- no products from genetically manipulated organisms,
- less transport – fewer journeys and shorter distances,
- use of less environmentally harmful packing material,
- wages which secure the existence of producers and suppliers

In this second tender, there were 280 products sorted into 13 product groups. Compared with the first tender, approximately 400,000 CHF were saved, which should be used for improvements in the quality, such as, for example, more expensive but green products should be purchased. This corresponded to the principle underlying the tender that ecological and social improvements are allowed to cost more, but not, however, to that degree that the saving aimed at through the co-ordination be compensated completely.

In general, the biological foodstuffs purchased must be equivalent to the “*Ordinance on biological agriculture and the appropriate marking of plant products and foodstuffs*”

(*Bio – ordinance*)”²⁸ of 22nd September 1997. When purchases are being made, care is taken that only those products are purchased which are marked with labels which comply fully with, or actually surpass, the ordinance.

Since 1996 there is generally also a vegetarian line on offer, which is very successful. So for the period from 01.07.2000 until 30.06.2001 the following changes in needs could be noted:

- meat products: – 19,56 %
- fish / fowl: + 13,94 %
- fruit / vegetables: + 8,45 %

4.4 IT – Equipment

Within the informatics domain in the City of Zurich procurement is centralised, in accordance with a resolution passed by the City Council in 1999, (strategic purchases are centralised, operative purchasing transactions are decentralised). The board responsible is *Organisation and Informatics*²⁹ (OIZ) of the *Finance „Departement“*³⁰, for example, was instructed to set standards for PC working places and to set these down as binding in the “*List of Standard Products and Suppliers*”³¹. If required, the „Departements“ and boards can – with reference to the frame contracts closed by the OIZ – purchase the equipment themselves or let the OIZ procure it for them. The annual total expenditure for hardware in the informatics domain amounts to 27.9 million CHF (17.7 million €). This figure does not include the software, maintenance, hiring/leasing costs of equipment and expendable items. In addition to the costs for hardware, there are also those for fax and copy machines, which are procured centrally from the *School and Office Materials Administration* of the *School and Sports „Departement“*³². For copy machines, leasing contracts are closed with the suppliers. Payment is made according to the number of copies made and all the maintenance service is included in the price. The annual total expenditure for fax and copy machines amounts to 2.57 million CHF (1.64 million €). In the year 2000 the total sum paid out for IT – goods (only hardware) inclusive fax and copy machines was 30.47 million CHF (19.38 million €).

In the domain of PC systems it can be assumed that in Zurich around 6–7,000 work place systems will be installed of which, annually, approximately a fifth will be replaced. In this segment, the annual expenses (for PCs, monitors, printers and servers) come to 3.24 million CHF (2.06 million €).

The entire expendable items (for example, CDs, printer cartridges, toner cartridges, diskettes etc.) amount to 757,000 CHF (481,452 €).

²⁸ ger.: “Verordnung über die biologische Landwirtschaft und die entsprechende Kennzeichnung der pflanzlichen Erzeugnisse und Lebensmittel (Bio – Verordnung)”

²⁹ ger.: Dienstabteilung Organisation und Informatik

³⁰ ger.: Finanzdepartement

³¹ ger.: „Liste Standardprodukte und Lieferanten“

³² ger.: Schul- und Sportdepartement

In some of the electronic data processing centres of the OIZ the change-over to new equipment brought about, in part, considerable savings in energy, and in some individual cases the energy requirements were reduced to need only 15 % of what had been previously required.

In the domain concerned with PC work places, tenders are put out for the equipment conform with GATT/WTO, and in the tender the current energy-saving label is requested as conditional. On account of the different installation and operating requirements of the „Departements“ and boards, the OIZ can exert only a limited amount of influence on the actual use of the energy-saving facilities of the equipment. How much energy potential is thus lost cannot be assessed.

For the printers, the OIZ prefer combined drive equipment (one printer per storey), which can be used also as a copy machine, which helps to save resources to some extent by reducing the type and number of machines. In general, it is attempted to prolong the working life of equipment, especially that of CRT monitors.

The latter receives considerable support through the decision of the City Council that in the next two years when monitors are to be purchase there should be on no account any change-over to TFT monitors. The reason for this is, on the one hand, the not inconsiderable price difference that still exists for these two kinds of monitor. On the other hand, there is some doubt about the statement that the TFT monitors are better for the environment as they require less energy, while, however, there seems to be no evidence that they have a similarly long life expectancy than the CRT monitors.

4.5 Expendable medical items

The *Office for Nursing Homes*³³ in the City of Zurich purchases expendable medical items exclusively for nursing homes but not for hospitals or homes for the aged. In the year 2000, the account group for “medical expenditure” (medicaments, gases, bandages and dressing material, instruments and utensils, external medical service) as well as for disposable nursing material from the account group for “household expenditure” spent 3.73 million CHF (2.37 million €). The disposable nursing material consists almost exclusively of incontinence products.

For the products named above, the amount stated as having been expended by the *Office for Nursing Homes* is equivalent to about a sixth of the total expenditure of the City of Zurich in this sector.

The total expenditure including the cost of personnel, administration costs, etc. ran up for the nursing homes in Zurich in 2000 to a total of 125.9 million CHF (80.1 million €) In the year 2000 the nursing days numbered 511,839.

The product group in Zurich to which especial importance is attached is that with incontinence products. Of the stated 3.73 million CHF, alone 18.2 % is spent on just these products.

In general, it can be said that the products possess in any case a relevance for the environment if one merely considers the amount of waste that results and the resulting costs. All of the products that come into use are disposable. The convenience, the use

³³ ger.: Amt für Krankenhäuser

of these products offer, for both the patient as well as for the personnel does have, however, a considerable influence on the labour costs. In the tender for incontinence products the cost, the service and the quality stood to the fore. The only ecological requirement expressed was that the packing materials should be taken back. Reasons for expressing further ecological requirements (e. g. material, LCA) were lacking.

4.6 New buildings, floor coverings, furniture, lighting, renovation of buildings, sanitary facilities and white goods

New constructions and the restoration of buildings in Zurich are the responsibility of the *Building and Construction Board* within the *Building and Construction „Departement“*. For the buildings which are to be newly erected and for the buildings which are to be restored, the *Building and Construction Board* is also responsible for the fittings i. e. for furniture, floor coverings, lighting, sanitary fixtures and white goods. Of the total expenditure for new constructions and for the renovation of buildings in the year 2000, 289 million CHF (184 million €) were spent in all. 49 million CHF (31 million €) were clearly allocated to the new constructions and 169 million CHF (107 million €) were for the restoration of buildings. A further 71 million CHF (45 million €) were for additional hired construction work which could not be divided into new building or respectively, in the renovation of buildings. This expenditure also includes, besides innumerable others (all the items according to the construction costs plan), exactly just those expenses for the previously mentioned five product groups for which it is not possible to obtain an individual annual sum.

Figure 3 Overview of the total stock of public buildings in Zurich

Source: Hochbaudepartement der Stadt Zürich, 2001

With the aid of Figure 3, six representative new construction and restoration projects of public buildings in Zurich were selected and the percentage share of the total erection costs for the product groups, lighting and lamps, sanitary fixtures, white goods, floor coverings and furniture, was calculated. From this percentage share the annual expenditure for these product groups was then estimated.

Table 5 Percentage share of the 5 Product groups of the total erection costs of selected, representative, public buildings

	HPS und C – Classes – Base ALLENMOOS II Zurich – Unterstrass	Local authority building Nr. 4	Nursing home Bachwiesen		School premises Kügeliloo		Average value	Estimation of the annual Expenditure **
	New construction	Restoration	Part restoration Tract A*	Expansion and conversion Tract B+C*	New constructi on	Restoration		
	%	%	%	%	%	%		
Lights and lamps	1.26	1.90	1.28	1.74	2.01	1.26	1.64	2.9979
Sanitary fixtures	4.34	6.54	4.82	1.40	2.40	2.75	3.58	6.5593
white goods	2.75	3.19	0.00	0.00	0.00	1.42	0.92	1.6877
floor coverings	1.42	3.52	2.83	3.43	4.65	4.34	3.75	6.8672
Furniture	3.91	1.63	3.33	3.40	5.38	3.91	3.53	6.4607

* Data according to final calculation – otherwise projected data

** Referring to the annual total expenditure of 184 million €

Source: Data of the Hochbauamt, Own calculations IFIP, 2001

Figure 4 Average percentage share of the stated products of the total erection and renovation costs of 6 representative public buildings in the City of Zurich

Source: Own representation IFIP, 2001

Based on the assumption that the *Building and Construction Board* is not the only board purchasing this product groups, it follows that the estimated values represent only an annual minimum.

Figure 5 Local authority building Nr 1 during the phase of renovation and expansion and after completion



Source: http://www.stadt-zuerich.ch/kap04/hbd/presse_und_publicationen_amthaus1.html

In Zurich it is exactly in the building and construction sector that great efforts are made to take into consideration ecological criteria when buildings are to be erected or renovated. Within the *Building and Construction “Departement”*, the *Board for Sustainable Building*³⁴ sees to it that ecological requirements are complied with. For

those responsible for the building activities of the city, as well as the commissioned architects, engineers and specialists, the documentation BUILDING+ECOLOGY is issued at regular intervals. This documentation contains numerous measures for the implementation of ecological criteria when building materials are to be selected and when buildings are to be erected implementing ecological principles. The following recommendations and guiding principles are representative for the ecological requirements which should be followed:

- Minimal use or none at all of wood from tropical rain forests; in general, exclusive use of timber from sustainable cultivated woodlands (FSC Label)
- Minimal use of PVC
- The use of construction materials which are solvent – free or contain only a minimum of such substances
- Avoidance of compounded materials
- The use of recycled products or, at least, the selection of those construction materials which can be recycled
- Preference for building materials made of renewable raw materials
- Water saving measures
- Optimisation of the use of energy in the production of building materials and in the construction process itself

Efforts are made not only to use individual green materials in a purposeful way, but attempts are also made to evaluate complete buildings with the aid of lifecycle assessment. This task is usually carried out by external, independent specialists. The lifecycle assessments are carried out based on the data catalogue of the *Swiss Union of Engineers and Architects*. Through this measure, the building is considered as an entity and also with regard to the effects it has on the environment based on observation of its life–cycle. Long periods of use and minimal environmental effects are aimed at.

A further aspect relevant to procurement will be dealt with in more detail in the following text, namely the MINERGIE standard in the building sector. MINERGIE is a registered trade mark and a quality label for new and restored buildings with much stricter requirements regarding the energy demand than exist at present. The trade mark is supported by the Federal State, the Cantons and also by Trade and Industry, it is a protected label.

The MINERGIE reference values for heating residential buildings are:

New buildings:	45 kWh/m ² a (160 MJ/m ² a)
Buildings built before 1990:	90 kWh/m ² a (320 MJ/m ² a).

The MINERGIE reference values for heating official buildings are:

New buildings:	40 kWh/m ² a (145 MJ/m ² a)
Buildings built before 1990:	70 kWh/m ² a (250 MJ/m ² a)

Figure 6 Comparison of the different energy standards for new buildings

Source: Hochbaudepartement der Stadt Zürich, 2001

As a rule, this standard corresponds to a specific energy consumption which is from 30 % – 40 % lower than that prescribed in the present – day regulations (New Buildings Act). In Zurich, new buildings must come up to the MINERGIE standard. In the case of restoration, 25% of the projects must come up to the MINERGIE standard by 2005 and 90 % by the year 2010. Any deviation from this stipulation requires founded justification.

4.7 Paper

The paper products for office use in Zurich are obtained by the *School and Office Materials Administration* mainly by centralised procurement. A City Council resolution passed in 1997 requires schools and the city administration to obtain all products and services in the office material sector (e. g. paper), office machines and printed matter from the *School and Office Materials Administration*. This supply monopoly is in force since 1999. However, the city administration acts only partially in accordance with this stipulation (see also Chapter 4.8 and 4.10). In the case of paper, the schools are supplied to 100 % and the administration to approximately two – thirds of their needs. Paper for copiers and printers constitute the main part of the total paper needs of this sector. The *School and Office Materials Administration* estimates that it purchases 90 % of the paper needed for copiers and printers. Exclusively copy paper of Swiss manufacture and bleached without chlorine is purchased. The present proportion of natural white paper to natural grey (recycled) paper is about 70:30. Despite the stipulation (Order of the City Council in 1991) to use recycled paper throughout the administration, the proportional share of recycled paper is small. The fact that the use of recycled paper is no longer advertised (for example, in the order catalogue) has also contributed to this. The total expenditure for paper office materials cannot be stated. The annual expenditure for copy paper, writing paper, note – pads and self – stick note

blocks amounts to 901,000 CHF (573,000 €). In all, about 10 million CHF (6.4 million €) is spent annually for office materials, printed matter, paper and for copy machine management.

4.8 Office materials

Also the non–paper products in offices are procured in Zurich by the *School and Office Materials Administration*. As in the case for paper, the schools are supplied to 100 % and the administration to approximately two – thirds. The *School and Office Materials Administration* estimates that they themselves procure approximately 80 % of the total non – paper office material needed. For non – paper office goods (ballpoint pens, pencils, ink cartridges, toner cartridges, copier and printer foils, glue, files and letter–files) 1.13 million CHF (0.72 million €) are spent annually. In the opinion of the responsible purchasers the supply of declared green products on the market was greater at the beginning of the '90s than it is today. In general, it is noted that in the schools and in the administration the demand for green office materials is in decline.

When it comes to replacing toner cartridges, “*High Capacity Rebuild*” cartridges, which, as a rule, contain 30 % more toner than the original cartridges, are inserted, and therefore save 30 % of the costs for both the purchaser and the supplied customer. Generally the department tries to procure such “win – win” products.

As green products, which have caught on in the non – paper office materials sector, solvent – free correction fluids, ballpoint pens with refill cartridges and signature folders made of untreated cardboard were named. However, in the order catalogue of the *School and Office Materials Administration* the more advantageous green products are not especially marked as such or promoted.

4.9 Pest Management

Green open spaces, having a total of 27.4 million m², cover around a third of the urban area and belong to the City of Zurich. The *Green City of Zurich*³⁵, a board of the *Civil Engineering and Disposal „Departement“*³⁶ is responsible for care, maintenance and management. The green open spaces are divided into 9,261 single areas such as gardens, sports grounds, cemeteries, and recreation parks covering 9.1 million m², thirteen farms covering 6.3 million m², and also 12 million m² of woodland.

³⁵ ger.: Grün Stadt Zürich

³⁶ ger.: Tiefbau- und Entsorgungsdepartement

Figure 7 Composition of the 15,4 million m² green open spaces in Zurich (excluding woodland)

Source: Grün Stadt Zürich, 2001

In addition there are 9.9 million m² woodland in the possession of private persons, timber co – operatives, the Federal State and the Canton.

The ecological management of the urban green open spaces is rated highly. In 1995, when the “*Administrative ordinance concerning the maintenance and management in harmony with Nature of urban green and open spaces*”³⁷ went into force, the City of Zurich committed themselves not only to saving auxiliary materials and to the upgrading of living spaces, but also to close material cycles. One measure is the thrifty use of pesticides. In this sense, also the agricultural areas are managed in accordance with the *Bio – ordinance* (see Chapter 4.3). In 1999, the *Green City of Zurich* received the international label FSC (Forest Stewardship Council) for the sustainable management of their woodlands.

In 1999 the amount of pesticides shown in Figure 8 were used for the management of green open spaces with the exception of the agricultural areas. The total sum of expenditure for pesticides came to 20,260 CHF (12,885 €).

Figure 8 Pesticides, consumption and expenditure 1999

Source: Grün Stadt Zürich, 2001

The range of products used for pest control are examined continually in co-operation with independent research institutes, and only those products belonging to the toxic

³⁷ ger.: „Verwaltungsverordnung über die naturnahe Pflege und Bewirtschaftung städtische Grün- und Freiflächen“

classes 4 and 5, which can be obtained freely, are purchased (to obtain toxic substances belonging to toxic class 3 upwards a licence is required). Although, as a whole, it seems that the amount and the kind of substances actually used are indeed of rather minor relevance for the environment. In the cemeteries the use of herbicides has been given up and infrared is used to remove weeds in those areas.

4.10 Printing products

The printing products which are procured by the *School and Office Materials Administration* incur costs of at least 4 million CHF (2.5 million €) annually. Most of these printed products are school books. There is no information concerning the effects of these products on the environment.

4.11 Paper for hygienic purposes

Paper for hygienic purposes is procured by the *Board for the Cleaning of Buildings* of the *Real Estate Management*. 204,000 CHF (130,000 €) are spent annually on soap, toilet paper, disposable tissues, paper serviettes, hygiene bags, kitchen paper rolls, etc. For the procurement of this product group the same conditions are valid as for the cleaning materials. (see Chapter 4.1).

4.12 High voltage switching devices

The *Electricity Works* of the City of Zurich (ewz) is a board of the *Industrial Businesses „Departement“*³⁸. It disposes over a distribution- and transfer network as well as plants producing electric current. As one of the first Swiss enterprises to supply energy, in May 2000 the ewz was certificated according to ISO 14,001. As special features of the electric current supply of the ewz, there is the production of solar current as well as ecologically produced current from water power. Environmental protection is otherwise integrated in all the management decisions and business operations. An ecologically relevant example is the procurement of high voltage switching devices.

High voltage switching devices are used in transformer stations and in sub-transformer stations, where the different levels of tension are transformed into each other. In essence, a high power switching device possesses an extinguishing and an isolation function. These functions can be realised technically by the use of different materials. Today the materials used for these two functions in the high voltage switching devices now available on the market can be differentiated according to which function they have, where the isolation or, respectively, extinguishing function is achieved through:

- Air and, for the extinguishing function, also vacuum,
- Sulphurhexafluoride (SF₆),
- Oil or
- Solids (synthetics).

A switching device in which both functions are achieved by means of the vacuum technique has not been developed yet. Because of the fact that high voltage switching devices are absolutely essential for every power station, and that therefore substantial

³⁸ ger.: Departement der Industriellen Betriebe

amounts of SF₆ or otherwise oil are to be found in such plants, means that, especially in the case of accidents or the need for disposal, the environment is exposed to considerable pollution. Therefore great importance should be attached to the procurement of high voltage switching devices. As an example, in sum there are 10 tons of SF₆ present in all of the transformer stations of the ewz. At average annual losses of 0.2 % this means that 20 kg SF₆ are emitted to the environment. This corresponds, on a purely calculatory basis by applying the greenhouse potential of SF₆ (GWP/100 years) of 23,900, to around 478,000 kg CO₂ equivalents. And this does not take the ozone depletion effect into account.

The annual consumption of high voltage switching devices fluctuates strongly depending on whether merely a replacement is needed for old worn – out switches or if a whole plant is to be enlarged or newly equipped. On average, in 1999 and 2000, the ewz spent 410,000 CHF (261,000 €) on high voltage switching devices.

For the procurement of medium voltage switching devices, the ewz had a lifecycle assessment carried out by the ESU Services³⁹, and then decided accordingly what to buy in this product group. The decision fell on the product rated second by the lifecycle assessment because, from the economic point of view, it costs 14 % less than the product rated as being the most advantageous, which, however, also had fewer magnetic fields.

4.13 The cleaning of buses and trams

The *Public Transport Enterprise in the City of Zurich*⁴⁰ (VBZ) owns around 350 tram units (non-powered wagons + power units which corresponds to 180 – 190 complete tram sets) as well as 240 buses (inclusive 73 trolley buses), which are cleaned at regular intervals by machine. There are, in all, ten special car-wash plants. The annual expenditure, determined by the substitution of the car – wash plants amounts to around 500,000 CHF (318,000 €). Fully automatic car – wash plants equipped with water – reprocessing devices and partially with rainwater utilisation are put to use. Special attention is given to saving drinking water and also on labour costs. The profitability of this will become apparent only after more than 20 years. The amount of fresh water saved annually, for example in the Kalkbreite tram depot, amounts to approximately 5,700 m³

The VBZ has already implemented various different ecological measures. They have made increased use of particle filters in diesel motors and have also replaced diesel buses by electrically driven trolley buses. This line of action is based partly on legal stipulations e. g. the order to keep the air clean⁴¹ and partly on voluntary decisions made by the VBZ. In any case ecological considerations, namely, the reduction of air pollution in the City of Zurich stand to the fore. The particle filters already mentioned above reduce to 95% the particles which endanger health. The change – over from diesel buses to electric trolley buses has led to a high percentage drop in emissions as

³⁹ ESU-Services, Ökologiebezogene Unternehmens- und Politikberatung, 8610 Uster, Schweiz

⁴⁰ ger.: Verkehrsbetriebe der Stadt Zürich

⁴¹ Luftreinhalteverordnung

the electricity used comes mostly from hydro – electric power stations. These measures lead, in part, to extra costs annually.

Also, with regard to diesel fuel, exclusively non – sulphurous fuel (max. 10 ppm) is used as decided by the *Zurich Linked Transport System*⁴² since 1999. This incurs additional costs of approximately 0.5 CHF (0.3 €) per litre. This measure made it possible to reduce the annual emission of sulphur by some 800 kg.

In the case of paints and cleaning substances, since 1990 the VBZ relies on VOC – free products (paints which can be thinned down with water, and watery cleaning fluids). This has led, as a rule, to a reduction of costs as, in Switzerland, the VOC tax which is imposed there need not be paid.

⁴² ger.: Verkehrsverbund Zürich

5 Financial Significance of the RELIEF – Products – Overview

The following Table 6 is an overview of the City of Zurich's expenses for the product groups on the RELIEF products/product groups list. A more detailed account of how the expenses were obtained for each product/product group is to be found in the respective Chapters from 4 to 4.13.

Table 6 Overview of the expenses of the City of Zurich for the product groups on the RELIEF list

Product Group	Annual Expenses	Annual Expenses	Annual Expenses	Annual Expenses	Annual Expenses with	Annual Expenses in
	[1000 CHF]	[1000 €]	per 100 inhabitants [CHF]	per 100 inhabitants [€]	regard to the total expenditure [€pro 10'000 €]	relation to the total annual for procurement [€pro 100'000 €]
Cleaning Products*	885	563	245.2	156.0	13.3	116.6
Energy*	13,800	8,777	3,822.9	2,431.4	206.7	1,817.2
Floor Coverings* °	10,797	6,867	2,991.0	1,902.3	161.7	1,421.7
Foodstuffs*	20,204	12,847	5,597.0	3,558.9	302.5	2,659.8
Furniture* °	10,158	6,461	2,814.0	1,789.8	152.1	1,337.7
IT Products*	30,470	19,379	8,440.9	5,368.4	456.3	4,012.2
Lighting* °	4,714	2,998	1,305.9	830.5	70.6	620.7
Expendable Medical Items**	3,730	2,372	1,033.3	657.1	55.9	491.1
New Buildings*	49,000	31,164	13,574.2	8,633.2	733.9	6,452.2
Paper*	901	573	249.6	158.7	13.5	118.6
Office Materials	1,134	721	314.1	199.7	17.0	149.3
Pest Management**	20	13	5.5	3.6	0.3	2.7
Printing Office Materials*	4,000	2,544	1,108.1	704.7	59.9	526.7
Renovation of Buildings*	169,393	107,734	46,925.9	29,844.9	2,536.9	22,305.2
Sanitary Facilities* °	10,313	6,559	2,856.9	1,817.0	154.5	1,358.0
Paper for Hygienic Purposes*	204	130	56.5	36.0	3.1	26.9
“White Goods”** °	2,654	1,688	735.2	467.6	39.7	349.5
High Voltage Switching Devices*	410	261	113.6	72.3	6.1	54.0
Cleaning of Buses and Trams**	500	318	138.5	88.1	7.5	65.8
Total	294,651	187,396	81,625.3	51,913.1	4,412.8	38,798.3

* Core Product Groups in the RELIEF Project

** Product Groups specific to Zurich

° Included in New Buildings and Renovation of Buildings

Source: Our own investigation and own calculations, 2001

In Table 6 above, it is to be noted that, as stated in Chapter 4.6, the expenses for floor coverings, furniture, lighting, sanitary facilities and white goods are already included in the expenses calculated for the new construction and the renovation of buildings and so they are not taken into consideration in the calculation of the total amount.

The following diagram, Figure 9, shows what percentage of the total expenditure for procurement in the year 2000 (483 million €) was for each of the RELIEF products; floor coverings, furniture, lighting, sanitary facilities and white goods again are included in the share for “new buildings and the renovation of buildings”.

If one considers the sum of the expenses which can be assigned to the RELIEF products, this comes to some 38.8 %.. So no statement can be made, at present, of the 61.2 % of the expenses which were calculated in the public budget of 2000 as being relevant to procurement.

Complete and unquestionable figures of the expenses for most of the products cannot be obtained, however, from the public budget plans, because, in individual cases the

products are of minor importance and therefore are not earmarked for a position in their own right in the public budgets.

With regard to the 61.2 % share marked in Figure 9 “No available information” it must be said, however, that it includes such financially important items as civil engineering and road maintenance. Furthermore, in many cases, the expense figures obtained are the minimum values as, in a decentralised procurement organisation, not all of the actual purchasers of the products could be questioned.

The expenses obtained and stated in Table 6 can, however, in the majority of cases, be clearly assigned to the product groups under examination.

Figure 9 Selected RELIEF product shares of expenditure for Procurement in the year 2000

Source: Our own research and own calculation, IFIP, 2001

6 Final Comments on the Importance of Green Procurement in Zurich

Since the end of the '80s, the procurement of green products has become a matter that has to be considered. Procurement was initially centrally organised but, in the course of time, it has become increasingly a matter of decentralised organisation. Because of the re-structuring of the administration and the decentralisation of procurement procedures, which are still in progress, it is difficult at present to gain a complete overview of green procurement in Zurich.

Also, in those sectors where procurement is still predominantly a matter of centralised organisation, and especially when alternative ways of procurement are open to the users, (e. g. paper and office materials), the purchasers are forced more and more into the role of “intermediary traders” who have to select their range of goods according to the “wishes of their customers”. In these cases it is sometimes necessary to initiate information campaigns aimed at creating an awareness in the end-user, (and thus a demand) for green products.

The situation in Zurich is aggravated especially by the lack of a catalogue of criteria which is binding for all procurement processes and for all the relevant product groups. In those sectors which are already certificated according to ISO 14,001, such catalogues do exist but, as a rule, for only a specialised field (e. g. building and construction). Globalisation and consequently the extensive opening of the markets also makes it difficult to introduce green procurement on a wide scale. The fact that many procurement processes have to proceed according to general tendering guidelines (GATT/WTO) leaves little scope for the implementation of demands to be made of products. Especially in the services sector, (e. g. the cleaning of buildings), where a service carried out by an authority is in direct competition to that of a private enterprise, a step backwards can be observed as far as environmental demands are concerned. Because private enterprises attach little or no value to environmental criteria and also pay the lowest possible wages, they often succeed to offer their services much cheaper than the authorities can do. In this connection, a comprehensive catalogue of criteria which is binding for all would be supportive already in the tendering phase of green procurement.

The figures obtained for the importance considering the expenses side of the RELIEF products list in Zurich showed that only around 40 % of the estimated expenses for procurement could be covered from the calculation for 2000. This is because, on the one hand, many products obtained by decentralised procurement (e. g. by a frame contract) are, in individual cases, of little significance and therefore possess no position in their own rights in the budget. Thus the estimation of the expenses which are relevant to procurement is difficult. On the other hand, such important product groups as road construction and maintenance, public transport, medical care through hospitals etc, are included in the 60 % share which was not covered.

7 Analysis of Hurdles

7.1 The importance of identification of hurdles in Zurich

In 1987 the programme on “Green Procurement” in the public administration of the City of Zurich began under the responsibility of the *Environmental Protection Board*. In the beginning there were intensive activities in this centralised programme and good results were produced, but then it continued at a lower level and, still later, the activities regarding green procurement were integrated in the efforts made to introduce environmental management systems. In 1997, the City Council of Zurich had decided on the decentrally organised introduction of environmental management systems on the level of boards. Meanwhile, there are certificated environmental management systems in the first administration units.

Thus, in Zurich, the conditions are good for further progress to be made in green procurement. Nonetheless, the persons acting for the City of Zurich name a few reasons why Zurich has dedicated itself anew and intensively to the topic of “green procurement” within the framework of the RELIEF project:

- Environmental products incur additional costs. This is not in the first place the fault of the way the criteria are listed, but rather that of large-scale **market analysis**.
- It is, in part, difficult to break down **traditional ways of thinking**.
- It is not clear how **environmental criteria** can be included **in measurable form in tenders and in the placing of orders**. It must be made sure that complaints stand examination

The experience made with the previous programme for green procurement and its ultimate transition into efforts to introduce environmental management systems underline the importance of these elements of the implementation phase.

7.2 The Scientific Background

Hurdles are factors which cause disturbances in processes. In the case of green procurement, they obstruct the inclusion of environmental aspects in the procurement process of local authorities. The aim of the hurdles analysis within the RELIEF project is therefore

- to identify and to localise the hurdles
- to determine the relevance of these hurdles
- to develop strategies to overcome these hurdles

Hurdles accompany every business process. A pro-active way of handling these hurdles does, however, contribute towards closing the gaps between the objectives aimed at and the actually achieved stage of implementation, i. e. to overcoming hurdles. The strategies for this need, on the one hand, to be assigned to the relevant agents and, on the other hand, require active participation of the same. It is, however, quite possible that an obstacle lies outside the sphere of influence of the local authorities. In that case, the possibility to exert an influence indirectly, e. g. by lobbying is to be examined.

7.2.1 The “decision – making body” as a starting point for change

The various representatives of interests and decisions concerned with public procurement can be referred to in summary form as the decision – making body. The potential hurdles can be assigned to the different sections of the decision–making body, as it is the individual agents who are decisive in overcoming hurdles in the procurement process. As the decision – making body is frequently characterised by a high degree of complexity, one may speak here of a “multi – agent – process”. The relevant sectors are:

- the procurement sector
- the environmental sector
- the finance sector
- the users in all sectors

Each of these sectors are composed of an operative level, i. e. the specialists, and a strategic level, i. e. the heads of the sectors. Moreover, on the strategic level, the political representatives, e. g. the Mayor, also influence the procurement process.

Driving forces, which affect the local authorities from without:

- the State (the country or EU), responsible for the legal framework
- the market, which delivers the products and determines the prices
- the citizens, who assert their influence especially through elections

Figure 10 below shows the relationship between the different agents.

Figure 10 Decision–Making Body

The possible hurdles must be assigned to the different sectors. Each agent must contribute towards overcoming these hurdles.

7.2.2 The procurement process as an especial decision–making procedure

Within the framework of the procurement process in local authorities the following stages in forming a decision must be gone through:

Figure 11 The Decision-Making Procedure

- 1. Determining requirements:** At this stage the requirements of the subsequent user (the authority where the requirements are needed) has to come to an agreement with those responsible for procurement. For the user, the aim that is first and foremost is that the product fulfils the purpose for which it is made. However, those responsible for procurement follow concrete procurement aims. These are based on financial aims, legal stipulations, environmental targets and general administrative objectives. Individual and organisational aims must be balanced. The local authorities have organisational objectives while, on the other hand, each agent endeavours to achieve his own aims (e. g. security, career or personal environmental protection aims). So, individual aims must be identified and organisational aims be communicated. Each individual employee who is involved in the process must be convinced of the need for green procurement.
- 2. Looking for alternatives:** For one thing, there seem to be more products on the market than are known to those responsible for procurement, i. e. this lack of information as an obstacle is to be eliminated. For another, the market may not be ready for certain green products. To be able find out what possible options there are, market research concerning procurement should be carried out. Further to this, the local authorities possess a market force and are thus able to make specific ecological demands on the market.
- 3. Selecting alternatives:** Within the framework of possibilities of the surrounding circumstances (e. g. the legal framework) the criteria according to which orders may be placed should be determined. The placing of an order is finalised after an alternative has been evaluated and selected, i. e. the *decision* as such.
- 4. Implementing the decision:** After the contract has been closed, the actual purchase(s) is(are) to be carried out. Ideally, there should be a “feed forward”, i. e. the passing on of impulses with regard to the continual improvement of the three preceding stages.

7.3 An Empirical Analysis of the City of Zurich

7.3.1 Design

The design of the on – the – spot investigation is subdivided into a standard questionnaire and a structured interview. As presented above, different organisational levels and fields of work influence the process of procurement, and the decision – making process this involves, in the local authorities. That is why the public procurement was analysed as a multi – agents – process. The agents questioned represent a selection taken from the:

- political decision – makers
- leading persons in various boards, departments and offices, e. g. environment, finance, general administration
- representatives of environmental administration
- those responsible for the procurement of various objects and
- purchasers

With the help of standardised questionnaires, the estimations of eight City of Zurich employees were asked for. The aim of the questionnaire was to make the test persons familiar with the analysis of hurdles, to be able to identify such, and to be able to determine their relevance. The perception of the hurdles at hand was investigated on the basis of 22 statements (see Appendix). The results formed the basis for the assignment of the need to act to agents and to the stages of the procurement process. Furthermore, the questionnaire provided the framework for the structured interviews, which were carried out with the agents on the spot. The purpose of the interviews was to reconstruct the process of introducing procurement activities which are more green, to understand the internal decision – making procedure, to examine the individual views of the test persons and to encourage a self – evaluation. In accordance with these aims, the analysis combined the individual perceptions of the agents with the external view of the investigators.

First of all, the questionnaires were evaluated. The results of the interviews served to mirror the results of the questionnaires and were therefore integrated in the account of the challenges and recommendations for action made to the City of Zurich.

The selection of agents and their restricted number sets some limits on the study. For sure, a number of opinions as well as interesting information were not included. Accordingly, as this restricted insight into what is, in part, a complex mutual interaction between the agents, the account cannot be considered as being absolute. Nonetheless, the combination of the data obtained does provide an expressive picture of the decision – making procedure for green procurement and the hurdles involved. The analysis does not cover any of the external conditions, such as the market conditions and the legal situation, but does, however, include the views of the test persons on these topics. Analysis of the relevance of the hurdles in the City of Zurich

An evaluation of the answers in the questionnaires on the relevance of the hurdles came up with the following picture. The hurdles were sorted according to their average perceived importance. The sequence corresponds to that given in the Appendix:

Figure 12 Profile of Perceived Hurdles

This analysis shows how the hurdles are perceived. These hurdles can be subdivided into three groups:

- **red:** perceived as a serious obstacle. The average perception lies above the “I tend to agree” line.
- **blue:** perceived as a minor obstacle or one which has been overcome already. The average perception of these hurdles lies between the “I tend to agree” and the “I tend to disagree” lines.
- **green:** not perceived as an obstacle or already overcome. The average perception lies below the “I tend to disagree” line.

Within the framework of the RELIEF Project, the last group can provide the basis for a best sharing practice.

Table 7 The Three Classes of Perceived Hurdles

HURDLES (in order of their importance)	
22	stronger demand as pre-requisite
10	Legal regulations are unclear
8	Possibilities remain unused
3	Diverging points of view
15	No products available
20	Involves additional work
21	Subsequent costs are not considered
14	Identification is difficult
9	Legal situation is uncertain
18	The user is prejudiced
19	The administrative course is impeded
7	Guidelines offer no support
16	Products are too expensive
13	No information on alternatives
2	Not an aim of my local authority
5	No information on possibilities
6	Possibilities are insufficient
2	No information on environmental relevance
11	Legal framework is impeded
17	Limited functionality
1	Efforts are not worthwhile
4	No information on the aim

The hurdles should be overcome in their order of importance, i. e. one can begin at the top of the table and work down to the bottom. It is indeed sensible not to keep strictly to this order but to take into consideration the order of the ratings. Furthermore, hurdles which lie in the surrounding circumstances (e. g. in the legal framework) cannot be overcome directly by the City of Zurich.

In order to develop strategies with which hurdles can be overcome, the following questions must be answered:

- ***Were the questions uniform?*** This question is very important for the hurdles in the blue group. Some answers could be “I agree”, while others could be “I disagree”. In that case a lack of information could be an obstacle and the cause of deviation. The divergence within one question is to be examined.
- ***Which hurdles have been perceived as overcome already?*** If a hurdle was perceived as non-existent, two interpretations are possible: Either the hurdle never existed or it had been overcome already. In the first case, the reasons for this must be found out; in the second case, the City can be an excellent example for the others (best sharing practice).
- ***Can the City overcome hurdles?*** A local authority may not possess enough power to influence the market or the legislative. A RELIEF campaign having precedence may be able to help overcome these hurdles.
- ***Is the hurdle real*** (e. g. are there no product alternatives) ***or perceived by some of the agents*** (e. g. product alternatives exist but some agents do not know about them)? The results of the other work – packages may help here.

In the following diagrams, the hurdles stated in the questionnaire were assigned to the agents and stages of the decision making procedure. In each of the local authorities this picture may be slightly altered. The numbers in the following diagram correspond to

the order of possible hurdles obtained from the questionnaires (see Appendix on hurdles analysis).

Figure 13 Assignment of Hurdles to the Decision Making Body

Figure 14 Assignment of Hurdles to the Decision-Making Procedure

Further Results obtained from the evaluation of the questionnaire:

- It could be ascertained that the existence of guidelines for green procurement is not clearly known to all the agents questioned. The answers ranged from “yes”, “I don’t know” to “no”.
- Furthermore, it was to be noted that a clear preference exists to make better use of the given framework for green procurement. An expansion is not deemed as especially necessary.
- A comparison of the possible influence and the actual endeavours of the agents with regard to green procurement reveals an interesting result: the potential influence of the *Finance „Departement“* is estimated as being very great, whereas the endeavours of these agents are perceived as being rather small.

7.3.2 Challenges for the City of Zurich

The following section describes the interaction of the various agents in the City of Zurich as revealed, by and large, through the evaluation of the interviews. Selected recommendations on how to overcome hurdles are derived from this. Of course, it remains the task of the agents on the spot to set priorities. All the above results provide starting – off points to overcome hurdles.

1. As the implementation of green procurement in the City of Zurich could not be realised to the extent that was intended, those responsible must learn from the mistakes that have been made. The hurdles may have remained the same, despite the renewed start towards further development in the form of independent environmental management systems. It is recommended that the implementation problems be examined from which success factors for the newly started process are to be defined and to be strictly kept to.
2. Political signals and the role of the leading persons in the administration in supporting green procurement are, in Zurich, very important. As the example the *Green City of Zurich* shows, great changes in the direction of environmental orientation can be effected by alignment in the fulfilment of urban tasks. There, the management of the green open spaces in accordance with the rules of Nature will be carried out with great commitment. Not all of the respective agents are sufficiently aware of their active role as promoters. As evidently the importance of the topic of environmental protection has generally gone into decline, the topic of green procurement has also become less attractive to political agents.
3. Demands made because of the pressure resulting from intensive utilisation as, for example, in the case of sports grounds, occasionally restrict procurement activities from following ecological principles. Indeed, the users react in an irritated way to green products whose function is inadequate, which, besides the great importance attached to the price as a criterion for selection, restricts the potential demand from the user for green products.
4. This, in turn, is a risk for the purchaser who, as in the case of *School and Office Materials Administration*, have to compete with the free market, which leads, for example, to the removal of green products from the office materials catalogue. Furthermore, if one takes into consideration that the inclusion of environmental criteria, except for standardised products such as copiers, increases the costs for market analyses, one may come to the conclusion that an orientation towards the environment is not attractive to the purchaser.
5. Questions on finance are perceived, in general, as restrictive factors for environmental protection and especially for green procurement. The subsequent costs are still not taken into consideration everywhere to a sufficient degree, although they could even help to reveal economic advantages.
6. The market may also be a limiting factor depending on the quantity and quality of the supply, i. e. if no appropriate product is available. With regard to green products, there is a lack of market transparency as there are often no special distinguishing marks in the supplier catalogues. So it is unclear whether the environmental market has shrunk or whether the environmental criteria have become the current market standard.

7. The setting up of environmental criteria is not regarded by the purchaser as, in itself, a serious obstacle, but rather as the maintenance of current information e. g. if a positive list of cleaning materials which are to be used is no longer kept up to date on account of the extra time and effort this involves, it will be no longer used. However, there is uncertainty as to how environmental criteria can be included in measurable form in the tenders and also when placing orders so that appropriate decisions can be adequately founded. In addition, the unclear legal situation can, however, be put down to the lack of experience. So, at first, the work of preparing tenders will require much effort to get into a routine which will then make the process much easier.
8. Moreover, there is also the uncertainty many agents express about the ecological quality of products as this question has not been scientifically solved yet. The *Environmental Protection Board*, too, still cannot offer comprehensive expert advice. More information on green products is required, so that doubts concerning the lack in function or poorer quality may be dispersed.
9. As training for the purchasers obviously plays a subordinate role, there are among other things, a news – letter from the Commission for Public Procurement for the City of Zurich and also a comprehensive informal exchange of information between various centres of procurement which make a contribution to ensure a common level of knowledge. A network of knowledge can help to reduce the amount of time and energy needed in the search for information.
10. A centralised procurement which bundles the demand will be afforded more attention. An increase in the freedom of decision leads, as a rule, to a decrease in ecological orientation in procurement. It must be examined to what degree a greater demand can be achieved by the centralisation of procurement, and if this is politically desired. As the rapidly exhaustible potential will be used up already for green procurement, further possibilities should be looked for and utilised.

Appendix: Statements on the Analysis of Hurdles

1. The efforts made to further the implementation of green procurement are not effective.
2. The procurement of green products and services is not one of the aims of my local authority.
3. There are different views at several decision-making levels of my local authority concerning the inclusion of environmental criteria in the field of public procurement.
4. I am not sufficiently informed about the aims of green procurement.
5. I am not sufficiently informed about the possibilities to implement green procurement.
6. There are not sufficient possibilities for the inclusion of environmental criteria in the decisions on procurement in my local authority.
7. The existing procurement guidelines do not support the inclusion of environmental criteria in decisions on procurement to an adequate degree.
8. The possibilities which are given to include environmental criteria are not widely used in my local authority.
9. There are uncertainties regarding the legal position on the inclusion of environmental criteria.
10. The applicable law concerning the inclusion of environmental criteria is very unclear.
11. The existing legal framework prevents the inclusion of environmental criteria in procurement decisions.
12. I am not sufficiently informed about the environmental relevance of products and services.
13. I am not sufficiently informed about green product and service alternatives.
14. It is difficult to identify green products and services within the procurement market.
15. Green product and service alternatives are not sufficiently available on the procurement market.
16. Green products and services are too expensive.
17. Green products are less functional than conventional products.
18. Many users are prejudiced against green products.
19. Green procurement is obstructed by the administration procedures (e. g. because competencies are scattered).
20. The inclusion of environmental criteria in procurement decisions incurs extra work.
21. Subsequent costs (e. g. energy and disposal costs) are not included in the procurement decisions.

22. A greater demand for green product and service alternatives by the users within the local authorities is a prerequisite for more green procurement.