RELIEF

GREEN PURCHASING STATUS REPORT

Miskolc

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Executive summary

Green purchasers can make a significant environmental impact by purchasing environmentally friendly products with lower emissions, resource use and waste production, contributing to the development of the market of green products and, by this, triggering product innovation and development. The current report, prepared in the framework of the RELIEF project, provides an assessment of the purchasing practice and green purchasing potential of the city of Miskolc. The report will also serve to recommend policy guidelines for extending green purchasing in the Miskolc municipality, and contribute to the review of current European municipal green purchasing practices carried out by the project.

Miskolc, the third largest Hungarian City with 184,000 inhabitants and 453 municipal employees has a budget of about €107-110 million. The report analyses purchases made by the municipality. These purchases amounted to €5,125.4 thousand in 2000. They represent 16% of the city hall/municipality budget and 4.8% of the city budget. Purchases are mostly centralised and managed by 6-8 officers that belong to three different organisational units (the total number of organisational units is 13).

Hungarian law provides a favourable legal framework for including environmental aspects into the procurement process. Environmental specifications can be included into the technical specification section of the call for tenders, provided they are determined in a non-discriminatory way. Environmental criteria can be used as selection criteria. In addition, the law requires that, if all other aspects are equal, preference should be given to environmentally friendly products. The municipal regulation of Miskolc extends the effectiveness of the national act on public procurement to smaller purchases. Apart from this local regulation, however, Miskolc has not adopted further green purchasing regulations.

The city has no green purchasing policy and guidelines. This fact is one of the obstacles to a more extensive green purchasing practice. Other hurdles include the high costs of environmentally friendly goods and services, the lack of relevant information on the environmental impact of different product groups and the specific environmental characteristics of marketed products, the economic benefits deriving from the use of environmentally friendly products as well as the barriers stemming from the wrong perception of related stakeholders. Therefore, as next steps, the city should adopt a green purchasing policy setting goals, addressing hurdles and developing green purchasing guidelines providing necessary information for decision-makers.

Despite these obstacles, the city has already developed some limited green purchasing practices in 6 product groups including paper, cleaning materials, buses, mosquito and rat control, food for events and toilet paper.

A detailed assessment of the environmental impact, financial impact and environmental relief potential of 20 product groups was prepared. The analysis also considered the availability of alternative green products, the experience of the municipality with green purchasing and some other particular aspects like the demonstrational, educational impact of the use of environmentally friendly products, and the market share of the municipality as a purchaser in the case of each product group.

Based on this analysis, product groups have been classified into 3 clusters.

In the first cluster there are 6 product groups: energy, outdoor lighting, renovation of buildings, road construction, road maintenance and buses. These product groups include

energy intensive products; hence they have high environmental impacts and significant impact on the global environment. This high environmental impact is coupled with a high financial impact, since some 95% of the municipal purchases focus on these product groups (excluding buses). Apart from buses, the city has no green purchasing experience related to these product groups. Due to the high environmental and financial relevance of these products, green purchasing strategies should be developed for them even if green alternatives are not always easily available.

The products in the second cluster have low or medium environmental and financial impacts. However, their relief potential is still relevant due to the special considerations related to these products. These product groups have either readily available green product alternatives, or the use of environmentally friendly products has a high demonstrational and educational impact, or the municipality has an important market share as a major consumer of these products. The most important products in this cluster are IT equipment and toys. Apart from these two product groups, paper, office materials, food for events, control of mosquitoes and rats, printing/layouting, and toilet paper also form part of the group.

Products in the third cluster include cleaning products, person transport, pest management and white goods. These product groups have a low or negligible environmental and financial impact in the case of Miskolc mostly because of the small quantities purchased. Although green product alternatives are available and there is even some green purchasing experience related to cleaning products, these products have low environmental relief potential and their inclusion into the green purchasing policy should be dependent on the amount of available (financial, human and organisational) resources.

Introduction

Environmentally conscious purchasing, which considers the environmental impact of the production, use and disposal of the products and services, can make a big difference by selecting products and services that minimise negative environmental impacts. This is particularly true for larger purchasers, such as local and national governments. These larger purchasers can also influence the market: by increasing the demand for environmentally friendly goods, they give signals to producers to increase the production of these products. Mass production of new and more environmentally friendly products, in turn, may finally result in the prices of such products decreasing, creating an opportunity to increase the number of purchasers who buy such products.

The RELIEF project, a co-operation between six European cities[1] and a consortium of research partners from five countries[2], lead by ICLEI, was launched to investigate what change local governments, as green purchasers can make, and develop a European strategy for green public purchasing. The project has multiple objectives, namely to (1) assess current green purchasing practices and potentials of the participating cities, (2) develop methods for the analysis of environmental relief potential as well as economic cost and benefits related to green purchasing, (3) set up an extensive set of data on environmental benefits which are potentially achievable through green purchasing, (4) recommend policies and tools promoting green purchasing and triggering product innovation on the European level and develop green purchasing guidelines for municipalities.

This paper was prepared in the framework of the RELIEF project. It provides an assessment of the green purchasing practice and potential of Miskolc. Miskolc began green purchasing activities quite recently, as part of its ambitious environmental policy. As a beginner in this field, Miskolc has a wealth of opportunities to improve its current practices in this area and to make its effort more systematic and organised. Furthermore, the municipality has the opportunity to develop a sound strategy and green purchasing guidelines, make administrative arrangements and extend green purchasing efforts to additional product groups. In carrying out this assessment, this paper aims to provide a basis for the Miskolc green purchasing strategy and the development of the local green purchasing guidelines, as well as contribute to the review of current European municipal green purchasing practices carried out by the project.

After a short historic background of the development of the Miskolc environmental policy, the first part of the paper will present an overview of the current purchasing practice of Miskolc including the following:

- the scope of purchases influenced by the local government,
- institutional responsibilities related to purchases,
- laws and regulations concerning local government purchases,
- current green purchasing practices, and

[1] Hamburg, Kolding, Malmö, Miskolc, Stuttgart, Zürich,

[2] Partners are as follows: International Council for Local Environmental Initiatives, European Secretariat; Institute of Public Finance and Infrastructure Policy, Vienna University of Technology; Institute for Environmental Studies, Vrije Universiteit, Amsterdam; dk-TEKNIK Energy & Environment; Inter-University Research Centre for Technology, Work and Culture, Austria; Center for Environmental Studies, Budapest and Chair of Business Management, Dresden University of Technology

- hurdles to the further expansion of green purchasing.

The second part of the paper will evaluate the current purchasing practice through relevant product groups. The green purchasing potential of each of the 19 core product groups will be evaluated from an environmental and financial perspective. The current purchasing practice will be reviewed to identify opportunities and threats to green purchasing, and the relief potential of the product groups will be assessed.

Based on this analysis, some policy recommendations related to green purchasing will be presented in the Concluding section. Furthermore, identification of the "next steps" which should be taken, suggestions of the relevance of the product groups considered for the projected green purchasing strategy of the city, as well as proposals for organisational and institutional changes also form part of this section.

Miskolc and its environmental policy

Miskolc with its 184,000 inhabitants is the third largest Hungarian city, it is the centre of Borsod-Abaúj-Zemplén County.

Industrial development of the city began in the last decades of the 19th century. The major engine of industrial development was the production of iron and steel products and manufacturing of machinery and equipment based on the local coal and iron ore (the city itself had four coal mines) and driven by the railroad development. Apart from this, foundries, steam mills, medium sized plants producing building materials, furniture, textiles, beverages, wood products, paper, and canned food were set up. During the communist regime, Miskolc became a major centre of the Hungarian heavy industry. As a result of the investments made in the 1960s and 1970s, during the early 1980s the output of iron and steel products surpassed 1 million tonnes annually, and the local metallurgy complex employed approximately 15,000 people. Total employment during that time amounted to 135,000, almost two-thirds of them provided by metallurgy, production of building materials and constructions. Parallel to the industrial development, population numbers also grew rapidly. Between 1960 and 1970, the population increased by approximately 100,000 people; new housing estates were also set up.

However, the city endured a significant price for this development. By the 1980s, it was one of the "Dirty Dozen", that is, the twelve most polluted Hungarian cities. The air was polluted by local industries, emission from the metallurgy complex, the general use of brown coal as a fuel (both in households and the paper mill), the cement factory, as well as emissions from the industrial plants of the region. Effluents from the local industrial plants turned the local creek into a sewer. There were also many illegal waste dumpsites.

With the depletion of local resources and the worldwide recession of the steel industry, local steel production started to turn very unprofitable in the 1980s. By the time the political changes occurred in 1989, the city already had serious economic problems. In real market economy conditions, the losses of local heavy-industry companies required more and more financial support from the consecutive governments. The industry was reorganised, privatised and sold several times, but more and more units had to be closed down and about 20,000 people were dismissed.

The collapse of the traditional heavy industry, though painful, also offered an opportunity to Miskolc for economic restructuring and environmental renaissance. While in 1992, some 70% of the local GDP was produced by heavy industry, by 2000 industry

contributed only to 34% of local GDP, and its structure had changed. New manufacturing plants were opened offering 1,000 to 1,200 new jobs. However, in 2000, 52 % of the local GDP came from services, including the new shopping centres that created 3,500 new jobs.

Economic restructuring of the city as well as the region brought about a visible improvement in the environmental quality. The industrial crisis was accompanied by a drop in pollution levels. At the same time, pollution from remote regional and trans-boundary sources also decreased significantly. Improvements were also facilitated by important environmental investments, the most important ones being the sewage treatment plants treating both communal and industrial sewage, and the fuel switch from coal to gas. The city struggling to maintain and enhance its attractiveness and competitiveness in order to attract investors, to keep young professionals and boost tourism, uses environment protection as a major tool.

Environment protection is a core part of the new city development strategy based on the vision of the future of Miskolc as a harmonic, liveable city that is a financial, commercial, industrial and academic centre of the region, and plays a leading role in the Carpathian Euro-region. Environmental strategy is one of the 7 partial strategies implemented by the overall city development strategies. The comprehensive environmental policy, adopted in 1999, pledges that the city in all its capacities, namely as a maintainer of institutions and an employer, as a regulatory body and a provider of environmental protection services, will observe environmental considerations. This, together with the continuous improvement of its environmental performance, will facilitate the environmental improvement of the city, the region and the earth.

In line with its commitment to environmental improvement, the city has been working on several environmental issues including energy efficiency (TWINERGY project supported by EU Phare), Local Agenda 21, EMAS, and most recently, green purchasing. These projects supplement and cross-fertilise each other and help to achieve better overall results. The City was awarded the Special EU Compliance Environmental Award for Water Management by the EU Commission in 1999 and the full EU Compliance Environmental Award in 2001.

Through this green purchasing project, Miskolc aims to decrease the load on natural resources as well as the carrying capacity of the planet, to raise environmental awareness of both employees and citizens and promote the production of environmentally friendly goods and services for the benefit of the global environment.

Procurement and purchasing practice of Miskolc

Possibilities for green purchases are defined by several factors. The following chapter will analyse some of these in the practice of Miskolc, namely:

- the extent and structure of purchases in order to see the scope for green purchasing,
- the way purchases are organised and purchasing decisions are made in order to identify where in the process environmental criteria can be inserted,
- the legal context, to understand what are the competencies of local government in making purchasing decisions and influencing the decisions of its institutions,

- existing green purchasing experience to summarise obstacles for extending the scope of green purchasing, and
- perceptions of municipal staff on green purchasing so to understand the perceptual (that is, hurdles which staff perceive to exist either through lack of awareness or having incorrect views on the area of green purchasing, resulting in misperceptions) and behavioural hurdles in order to progress further.

Extent and structure of purchases

When defining the scope for green purchasing, one has to define both the extent and scope of the purchases controlled by the municipality. The scope of purchases can be quantified from the budget relatively easily. Calculating the scope of purchases controlled by the local government is more complex. These purchases are made by three types of municipal organisations, that is, the municipality itself, along with its institutions and companies. There are significant differences in the extent and the manner of control over the purchasing decisions made by the mentioned organisations.

In an ideal case, green purchasing of local governments would include the purchases made by the municipality and the municipal companies and institutions. A pre-condition of such a situation would be that purchases of all the related organisations were controlled by or, at least, co-ordinated with the local government. Currently this is not the case. Both municipal institutions and municipal companies have independent, separate budgets and the local government has no control on the spending occurring from these independent budgets.[3] Municipal institutions are allocated a significant part of their budgets through the city budget. Municipal companies, however, are much more independent in budgetary terms. They may also receive occasional financial support from the municipality, but they mainly rely on their own revenues.

Municipal institutions predominantly cover operational and minor maintenance expenditures, this is typically salaries and related charges on the one hand and material expenses on the other from their budgets. Major expenditures of these institutions, however, including renovation of buildings, building of new ones, or purchasing of major equipment are covered in the budget of the municipality. As a result, the municipality controls this part of the purchases of municipal institutions.

The financial independence of municipal companies[4] is greater than that of municipal institutions. Municipal companies also have separate budgets, and they make independent purchasing decisions related not only to maintenance and operations, but also to capital development and renovation. The municipality still has some control over these purchases through its ownership and involvement with the Board of Directors, but it has not used this control to foster green purchasing practices, except in the case of buses purchased by the public transport company.

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[3] The municipal institutions' have a limited budgetary independence as major part of their budget comes from the city budget and they send regular financial reports for the municipality. The municipality, however, has no authority to decide what kind of products these institutions purchase for their day-to-day operations.

[4] Municipal companies include the public transport company, the district heating company, the district heating service company, water works company, the property managing company, the city management company, and the waste management company. Not all communal services are provided by the municipal companies. Some of these services are contracted out to private businesses (e. g. chimney sweeping, street lighting). They have concessions and operate completely independent from the municipality.

Figure 1: Different components of local government purchases

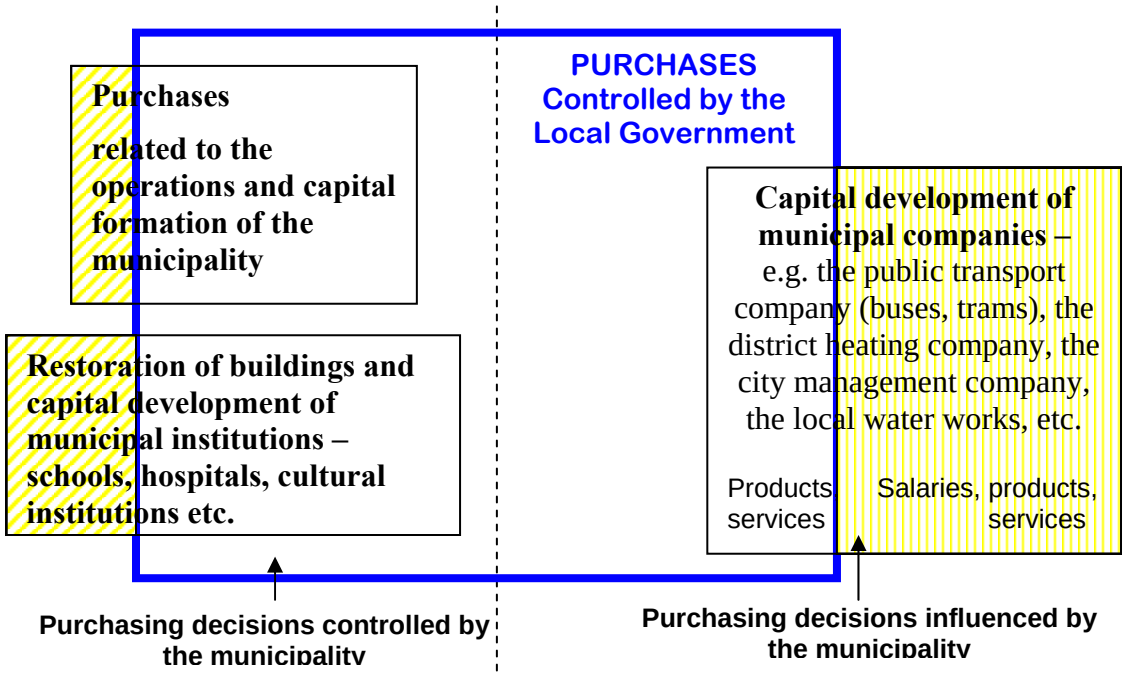
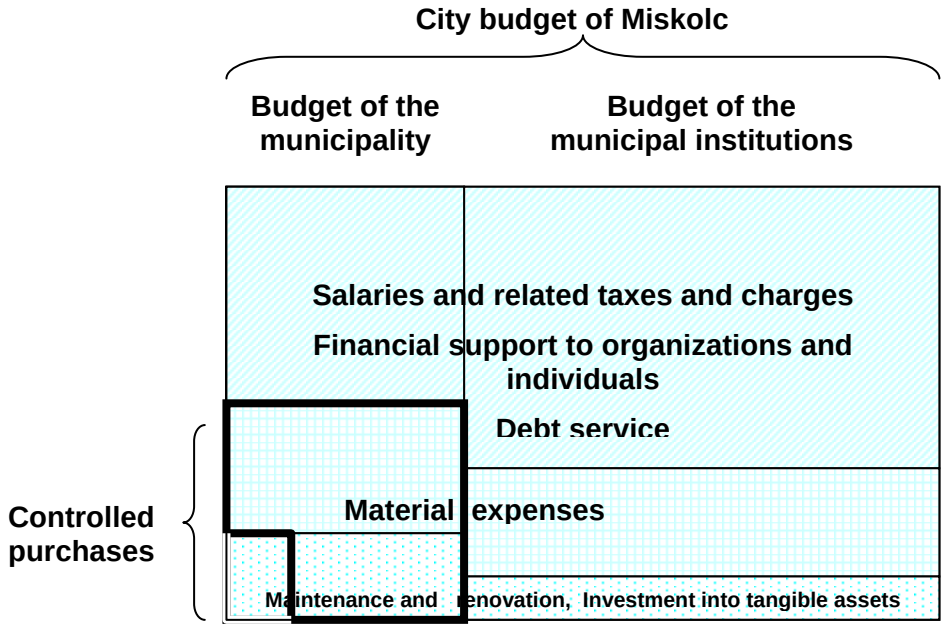


Figure 1 shows the different components of local government purchases analysed in the current paper. Figure 2 illustrates the ratio of total purchases to the total city budget. As already mentioned, the potential for green purchasing is represented by the amount of total controlled purchases (see the square framed in bold). If all purchases were "green", then the amount spent on green purchases would equal the amount of controlled purchases.

Figure 2: Local government controlled purchases within the city budget



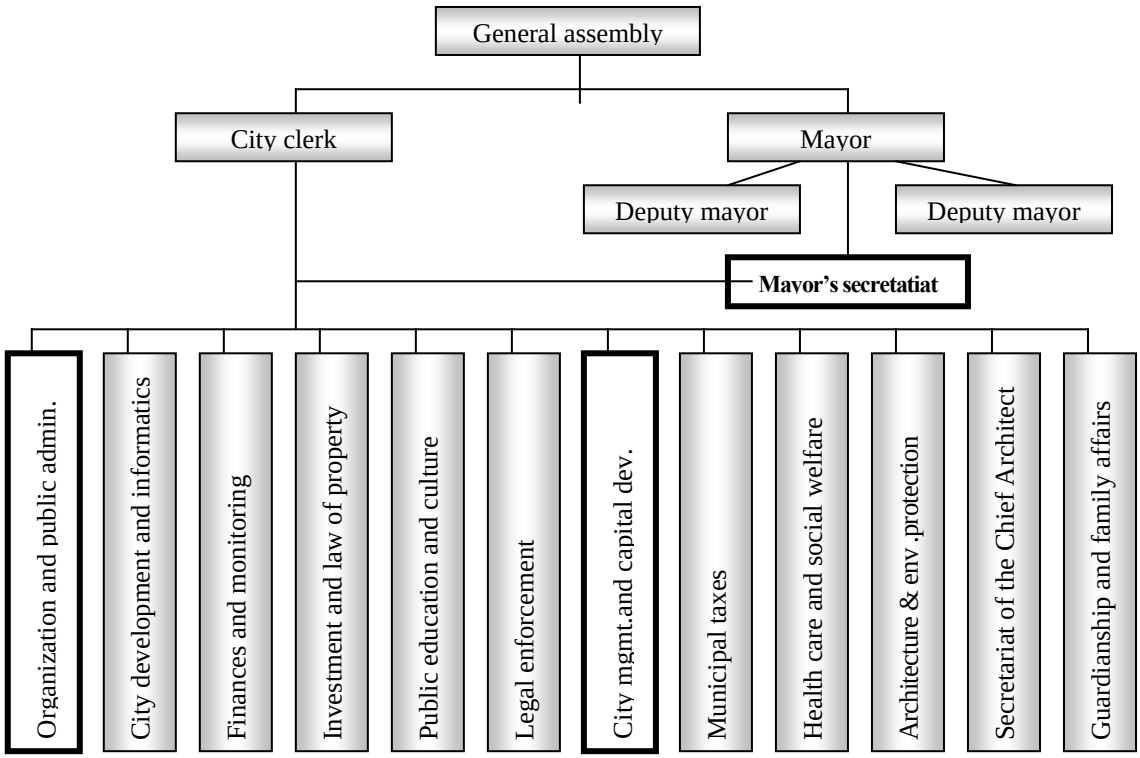
In the year 2000, Miskolc had an annual budget of € 106,7 million (approximately €110 million in 2001). From this amount, the budget of the municipality represented 36%

while 64% of the total city budget was transferred to the independent budget of the municipal institutions, for example, those of schools, hospitals, various cultural institutions, etc. The actual municipal budget amounted to approximately €31,9 million in 2000. Of this amount, some 50% was spent on salaries and salary related charges, and to the financial support of organisations and individuals as well as debt service. That is, items that do not include the purchase of goods and services. An additional 30% was spent on material expenditures, 18% on investments and 2% on maintenance, repairs and renovations. These items that are mostly used to buy goods and services amounted to almost €16 million. The actual amount of total purchases was definitely less, as investments may include costs of expropriation, acquisition of properties and related fees etc., but further approximation in the calculation would require a cumbersome item-by-item approach.

Institutional background of purchases

The municipality of Miskolc includes 12+1 departments and it employs 453 people (exclusive of staff from schools, hospitals etc.) whereby 3 departments and 6-8 people are involved in the purchasing processes.

Figure 3: The institutional structure of the municipality of Miskolc



Purchases of the municipality are generally centralised. In the case of products where the amount of annual purchases exceeds a limit value, the purchases are made through the tendering process. These limit values are €140 thousand for buildings and construction works, €70 thousand in the case of other products and €35 thousand for services. This implies road maintenance, road construction works, renovation of buildings, and mosquito control. Other products, such as paper, office materials, lighting fixtures and cleaning materials, are also purchased by procurement officials. But as they are regarded

as small items, that is, the annual purchases of these products do not surpass the annual limit value, they can be purchased without the standard tendering process.

The only exceptions from centralised purchasing include furniture and IT equipment. Users purchase these in a decentralised process, as long as the value of the purchase is below €20 thousand. If the limit is surpassed, public procurement regulations apply.

Centralised purchases are implemented by either the Purchasing Group of the Organisational and Public Administration Department (Purchasing Group), the Secretariat of the Mayor (Secretariat) or the City Management and Capital Development Department (Capital Development Department). The Purchasing Group and the Secretariat are responsible for the purchasing of small items, like paper, office supplies, cleaning materials, with the exception of purchases related to events. The latter are done exclusively by the Secretariat of the Mayor. The Capital Development Department is responsible for large purchases including road construction and road maintenance, renovation of buildings and new buildings of the municipality as well as the municipal institutions.

Legal context of green purchasing

Public procurement, including the procurement of local governments, is regulated by the Public Procurement Act, which was passed in 1995. This law primarily aims to promote the rational, effective and transparent use of budgetary resources. It also aims to create equal chances for competition, while considering the aspects of domestic productions and employment, as well as respecting restrictions arising from international treaties. It also provides several opportunities for green purchasing.

One method of green purchasing is to include environmental specifications into the technical specifications, along with technical and quality specifications. This is possible provided that specifications are determined in a non-discriminatory way.

Environmental criteria can also be used as selection criteria. The purchaser may apply either the ’lowest bid’ or the ‘best value for money’ approach in selecting the most appropriate bid. Nevertheless, the approach to be applied must be included in the call for tender and as well as the weight given to each selection criterion in the selection process. The best value for money approach may incorporate criteria, such as the contribution to the implementation of local employment policy, development of less-developed regions, implementation of the National Environmental Program or increasing the chances of small and medium sized enterprises in the bidding process. Furthermore, the law requires that, with all other aspects being equal, preference should be given to environmentally friendly products.

The city order of Miskolc on public procurement is based on the national Public Procurement Act. Its only additional provision to the national act is that it decreases the limit value of purchases affected by the public procurement process. Through this, it extends the obligation of preferential treatment of environmentally friendly goods and services to smaller purchases and procurement of lower values.

Apart from the general terms provided by the Act and the local order on public procurement, there are no specific green purchasing policies or guidelines adopted by the local council. The only ‘purchasing guideline’ that has an environmental impact is an

informal request of the Mayor to give preference to local or regional products.[5] The elaboration and adoption of such policies and guidelines is a pre-requisite to enable that further progress is made in this field.

Green purchasing experience in Miskolc

Green purchasing in the Miskolc local government is relatively recent. So far, green purchasing has been practised through *sporadic*, *non-integrated* decisions. Green alternatives were mostly chosen when they proved to be cheaper than customary products. As already mentioned, the city does not have a coherent green purchasing policy, let alone green purchasing guidelines. There are no cost-benefits analyses comparing short-term and long-term costs with the benefits before making a decision which product provides the best value for the customer. As in all Hungarian local governments, procurement decisions are guided by current prices because the municipality cannot afford, or has the impression that it cannot afford, to spend extra money on environmentally friendly or energy efficient, durable goods.

There have been a number of examples for environmentally conscious purchasing practices, which indicates an increasing level of environmental awareness and a growing interest in environmentally friendly products. This is despite the city's budgetary constraints, the lack of green purchasing traditions and green procurement municipal policy as well as green purchasing guidelines.

Since October 2000, the municipality switched to the use of envelopes from recycled paper and introduced the use of recycled A4 paper as well. Due to their lower price, a significant amount[6] of re-filled printer toners are used, although users are not satisfied with the quality of re-filled cartridges. According to their experience, re-filled cartridges do not last as long as the new cartridges. IT products which use these require frequent maintenance or break down easily. In addition, warrantee obligations of suppliers are broken if equipment is used with re-filled cartridges. This product group requires a thorough cost-benefit analysis to decide whether this purchasing practice is worth continuing.

Other green procurement decisions include the phase out of the use of the most toxic household chemicals, such as chlorine; the current initiative to switch to energy efficient street lighting fixtures; and the upgrade of the bus fleet of the public transport company with new buses operating with Euro III engines.

In the public procurement process, the city does require potential suppliers to meet legal environmental regulations. But, in most cases, calls for tenders do not include specific environmental requirements for the product. The two exceptions to this are as follows: the municipality requires that instead of the usual application of sodium chloride, less harmless substances should be used for winter defrosting of the roads. For mosquito control, substances inhibiting propagation of mosquito are preferred to toxic chemicals that kill insects. These requirements are built into the technical specification part of the calls for tenders.

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[5] This principle is in accordance with the national Act of Public procurement which allows to give preferences to bids contributing to the development of less developed areas as Miskolc and the region is regarded as such an area.

[6] No exact data available.

The opportunity to give preferential treatment to environmentally friendly products, provided that all other conditions are equal, has not yet been used. This is due to the fact that this precondition does not usually occur.

Some of the municipal institutions and companies have also begun green purchasing activities. There are two kindergartens where management provides special consideration to environmental issues, although these are exceptional cases. One of the kindergartens looks after children with food allergies, whilst the other is a Waldorf kindergarten. Additional costs of green purchasing are financed from grants or by the parents who channel their payment through foundations established to maintain these institutions. In the former organisation, children receive organic food partly from own production, partly bought from the market. The Waldorf kindergarten uses a wider range of ecological products including recycled paper, water-based paints, environmentally friendly cleaning materials, organic food and environmentally friendly furniture. There are also schools that place a high importance on the use of recycled paper as part of ecological education.

Another positive example is the municipal public transport company, a formally independent company with strict owner's control. The company has already undertaken some green purchasing projects (for example, it switched to lubricating oils that can be changed less frequently and by this reduces the amount of waste produced). The company is now in the process of replacing old bus fleets with eco-efficient new ones.

These examples indicate that there is a growing interest in green purchasing within the public sector. Purchasing practices of these organisations were not studied as part of the local survey because they are independent of the municipal budget.[7] However, these institutions provide a potential for extending the current municipal green purchasing practice. In future, the municipality and the interested institutions may form purchasing alliances, thus increasing their market share and bargaining potential.

Hurdles

Similar to other Hungarian municipalities and other Hungarian organisations, green purchasing in Miskolc is only at the initial stages. Therefore, Miskolc as a pioneer must address several external and internal hurdles, including the perceptual hurdles, in order to be able to make progress in green purchasing. These hurdles and institutional barriers will be reviewed in this section.

The most important hurdle, which hampers further progress, is the non-existence of a green purchasing policy. Developing such a policy demonstrates a certain level of commitment. It also promotes goal setting (for example, what percentage should green products and services represent of total purchases, what resources can be used for green purchases), identifies priorities (for example, what product groups should be preferred by green purchasing) and assigns responsibilities (for example, who should be in charge of managing the process). Without such a policy, purchasers have no authorisation and guidance; they feel that their green purchasing initiatives would involve a lot of risk.

[7] As mentioned, institutions and independent municipal companies were not included into the study because they generally make independent purchasing decisions and continue independent purchasing practices. The only exception was the municipal public transport company where the municipality as the only owner exercises a strict control over strategic issues of company operations, consequently it can influence how the independent budget of the company is spent.

Barriers seem to be overwhelming, as there is no strategy to address them. Hence, staff members wait for others to solve the problems.

A review of 11 municipal officials including 8 purchasers showed that:

- 8 municipal officials did not know the city management's goals related to green purchasing,
- 9 officials did not have adequate information about the possibilities of implementing green purchasing,
- all officials found their influence on including environmental criteria into public purchasing medium or low; 3 people felt they had no such influence what so ever,
- all officials expected a commitment on green purchasing from local policy makers and the management of the administration,
- 4 purchasers explicitly mentioned the lack of local regulations as an important hurdle,
- the officials interviewed assumed that green purchasing should be initiated by the decision-makers.

The staff members interviewed agreed that green purchasing is hindered by the higher prices of environmentally friendly products, the issue of scarce information on environmental characteristics of products, and institutional barriers; that is, the lack of concentrated procurement practices.

Due to the inadequate development of the market, environmentally friendly products generally cost more, sometimes significantly more than ordinary products. Purchasers are scared away by the high prices of environmentally friendly products, while on the other hand, the lack of demand does not provide incentives to the producers to obtain eco-labels, to increase supply and variety of green products and decrease prices. Some producers have even stepped back and given up the production of green products due to the lack of demand.

Another hurdle hindering progress is the lack of information about products and their environmental characteristics. Purchasers do not get sufficient information about the environmental impacts of different products in general as well as about environmentally friendly products. They do not know what the acceptable environment related parameters are, for example, the energy consumption of different products, chemical composition and harmful chemical components in cleaning products. There is insufficient information about the economic benefits of green products as compared to non-green products; for example, the amount of energy that can be saved, and how they can reduce operational expenses or save on waste disposal capacity.

Inadequate and incorrect information creates perceptual barriers. The interviewed municipal officials found themselves more or less aware of what green purchasing means but not all of them thought they were fully aware. Even this group of municipal staff that is closely related to purchasing and procurement issues, had some inconsistent views on the economic barriers to green procurement. They all found that green products are too expensive, on the other hand some reviewed municipal officials admitted that existing green purchasing practices of the municipality resulted in savings. Opinions of whether users do or do not have prejudices concerning green products were rather dispersed. It can be assumed that other relevant stakeholders, including the decision-

makers of the administration, the Council (Assembly), or the financial department are less informed about the concept of green purchasing. Staff members also lack information on institutional and the legal issues related to green purchasing, such as the possibilities to include environmental criteria in procurement decisions. Some of them also found the related legislation too complex.

Currently, there is no policy or guidelines on green purchasing, and individual purchasers lack information on the environmental impacts of different products. In this situation, decentralised forms of purchasing, where applied, result in institutional barriers to green purchasing.

Environmental evaluation of major product groups

The product groups along with the products purchased by the Miskolc municipality are similar to those purchased by the municipalities of Zürich, Kolding, Malmö, Hamburg or Stuttgart. This is despite that the structure of the Miskolc purchases is different from the structure of the other five cities and reflects some characteristics of the transition countries. A relatively high share of the purchases made in Miskolc is related to the establishment of the basic city infrastructure - road building and road construction. Renovation of buildings also represents a relatively high share of the purchases, as the city is still trying to make up for the insufficient maintenance and renovation work done before 1989. On the other hand, Miskolc cannot afford new buildings; there was no spending on new building during 2000. Although, the recently introduced government financial support provided to local governments for the development of the municipal housing stock may change this in the upcoming years. Miskolc cannot afford such “luxury” products as furniture, carpets or lorries. White goods are also very rarely purchased, and IT equipment represents a relatively small share of the Miskolc purchases.

Current differences in the composition of purchases are expected to level off in the coming decades. Nevertheless, the present purchasing structure provides a limit to the number of product groups where environmental alternatives exist.

Another difference between Miskolc and the other partner cities of the RELIEF project arises from the institutional arrangements for service provisions. For instance, some communal services usually provided by municipalities, such as wastewater treatment, waste collection and disposal, are performed by private business organisations in Miskolc. These organisations have long-term concessions and operate independently from the municipality. Therefore, their purchasing decisions, for example on the make and type of trucks and waste collection vehicles are made independently from the municipality. But in regards to the communal services, they were ‘purchased’ when the concessions were issued and no further purchasing decisions will be made until the concession contracts expire.

Hence, in the case of Miskolc, the following product groups are supposed to have environmental relief potential:

- cleaning products,
- energy (electricity/heating),
- food for events,
- furniture,

- IT equipment,
- lighting,
- paper,
- pens, pencils, highlighters, markers, plastic materials,
- person transport (municipal car fleet),
- pest management,
- control of mosquitoes and rats,
- printing, layouting
- renovation of buildings,
- road construction,
- road maintenance,
- toilet paper, napkins and hand drying,
- toys,
- white goods,
- bus and tram fleet of city owned operator.

The Miskolc municipality spends €5,125,450, that is, 16% of the total budget of the municipality on the above product groups (about one-third of the controlled purchases calculated earlier). These product groups are the 'core product groups' for the RELIEF project.

Table 1: Summary of Institutional Background of Purchasing for the Municipality of Miskolc

Product groups	Way of purchasing	Department responsible for Decisions	Green purchasing	
			experience	rate
Cleaning products	Centralised	Purchasing Group	Y	
Energy (electricity/heating)	Centralised	Purchasing Group	N	-
Food for events	Centralised	Secretariat	N	-
Furniture	**Decentralised**	Related departments	N	-
IT equipment	**Decentralised**	Related departments	N	-
Lighting	Centralised	Purchasing Group	N	-
Paper	Centralised	Purchasing Group, Secretariat of the Mayor	Y	
Pens, pencils, etc.	Centralised	Purchasing Group, Secretariat of the Mayor	N	-
Person transport (municipal car fleet)	Centralised	Purchasing Group,	N	-
Pest management	Centralised	Capital Dev. Dep't	Y	
Control of mosquitoes and rats	Centralised	Capital Dev. Dep't	Y	100%
Printing, layouting	Centralised	Purchasing Group	N	-
Renovation of buildings	Centralised	Capital Dev. Dep't	N	-
Road construction	Centralised	Capital Dev. Dep't	N	-
Road maintenance	Centralised	Capital Dev. Dep't	N	-
Toilet paper, napkins and hand drying	Centralised	Purchasing Group	N	-
Toys	Centralised	Council members	N	-
White goods	Centralised	Purchasing Group	N	-
Bus and tram fleet	Centralised	Other	Y	

A summary of the institutional background of these product groups and the related green purchasing experience is summarised in Table 1.

In the following sub-sections, the green purchasing potential of the municipality of Miskolc will be analysed by product groups specified. For each of the product groups, there will be a review of the major environmental impacts related to production, use and waste disposal phase of the life-cycle. Then an identification of the green purchasing alternatives and the availability of green alternatives in day-to-day practice will be examined. Finally, based on the previous analyses, the green purchasing potential related to the product group will be evaluated.

Cleaning products (all purpose, floors including floor polish, windows, rugs, laundry)

Environmental impacts

Cleaning products have a double environmental impact: they pollute surface water and have an impact (toxic or allergenic) on human health. The list of chemicals used in cleaning agents is very long. These chemicals have potential effects on both human health and the environment. The environmental impact can be significantly mitigated by appropriate sewage treatment.

Green product alternatives

Environmental specifications are traditionally concerned with the avoidance of certain chemicals.

Green alternatives in practice

At the municipality of Miskolc, cleaning is carried out by the municipality's own cleaning staff. Staff are specifically responsible for cleaning the buildings, washing curtains and towels. The Purchasing Group purchases cleaning products from retail shops. In making purchasing decisions, the Purchasing Group tries to follow the guidelines of the Public Health Agency based on occupational health considerations, as well as choosing environmentally friendly options within the strict budgetary constraints. As a result, the purchasing of harsh cleaning agents, like chlorine, has been abandoned but as yet, no further purchasing policies regarding cleaning products have been adopted.

Green purchasing potential

Miskolc spends a relatively small amount, that is, €7,000, which amounts to 0.14% of all purchasing expenditures on cleaning products. Due to the well-equipped wastewater treatment facility of the city of Miskolc, the environmental impact of cleaning products is rather low. Consequently, cleaning products have a low environmental relief potential.

Energy (electricity / heating)

Environmental impacts

Municipalities use energy for several essential functions. The primary use is to provide electricity for municipal buildings, heating of municipal buildings, fuel for car fleets and public transport vehicles, and lighting of public spaces. This product group consists of primary fuels or energy products and secondary energy services:

- primary energy products: electricity, natural gas, coal, biomass, vehicle fuels,
- energy service: district heating, street lighting service.

All sources of energy entail environmental impacts. These major impacts are summarised in Table 2:

Table 2: Contribution of specific forms of energy to selected impact categories

Impact category	Depletion of resources	Global warming	Acidification	Risk of radiation	Waste and soil pollution	Heavy metals
Electricity from coal	High	High	High	Low	Medium	High
Electricity from gas	High	High	Medium	Low	Low	Low
Electricity from nuclear	Medium	Low	Low	High	High	High
Electricity/ district heating from combined heat & power	Medium	Medium	Low	Low	Low	Low
Gas heating	High	High	Medium	Low	Low	Low
Coal heating	High	High	High	Low	Medium	High
Biomass	Low	Low	Low	Low	Low	Low
Hydro	Low	Low	Low	Low	Low	Low
Other renewables	Low	Low	Low	Low	Low	Low
Vehicle fuels	High	High	Medium	Low	Low	High (leaded) or Low (unleaded)

The principal environmental impacts from the combustion of fossil fuels are the release of carbon dioxide, the major greenhouse gas and the principal contributor to global warming. The burning of fossil fuels also releases other gases into the atmosphere, particularly sulphur dioxide and oxides of nitrogen, plus black smoke. Nuclear power implies a risk of radiation caused by accidents during the transportation of fuel or during the production phase, and safe disposal of nuclear waste is of major environmental concern. The use of fossil fuels and nuclear energy also contribute to the depletion of non-renewable resources. This regards car fuels as well. In addition, car fuels pollute the environment with their exhaustion that still may contain lead from leaded petrol or solid particulates from diesel engines.

Alternative energy resources, hydro, biomass, solar, wind, tidal etc. contribute to neither the depletion of global resources nor global warming (or only in a very minor way). Their environmental impacts are much less significant, but they also raise some mostly local/regional environmental concerns. Huge lowland hydro power stations may significantly influence underground water flows, and affect soils or change habitats that has an effect on local biodiversity. Although with smaller dams in mountainous areas the environmental impacts are less severe. Solar and wind energy raise aesthetic concerns,

the production of photovoltaic cells requires a lot of energy. Geothermal energy involves the problem of managing salinated underground water.

Green product alternatives

As all forms of non-renewable energy are associated with significant environmental impacts, the best green purchasing option is to use renewable energy, or buy electricity from renewable sources when and where available although, the amount of alternative energy available being still small. The contribution which renewable energy makes to the primary energy production of the European Community was just 6% in 1998, with biomass accounting for about 60% and hydro-power for 36%. The share of renewable energy in the Hungarian energy use amounted to 3% in 1998.

The second best option is to opt for resource efficient use of energy, that is, to buy electricity from combined heat and power facilities. Buying energy services instead of primary energy can facilitate efficient use of natural resources related to energy use. This arrangement provides an incentive for the utility company to improve efficiency of energy use.

A third option is to differentiate between different uses of fossil fuels and to switch from coal and crude oil (if it is still used) to natural gas, and, by this, eliminate additional environmental damage caused by coal, i.e. acidification and soil pollution whereby the latter is caused by coal only.

Green alternatives in practice

Miskolc purchases electricity (700,000 kW in year 2000) for lighting and operation of electric equipment. Heating of municipal building is done either by gas (to heat 4,680 m^3), or by district heating (district heating is applied on 130 thousand m^3).

In 2000, the municipality of Miskolc spent 27.6 million Forints (107,9 thousand Euros) on energy. Of this amount it spent

HUF 14,906,000	54%	on district heating services,
HUF 2,849,000	10%	on natural gas,
HUF 9,865,000	36%	on electricity.

The municipality of Miskolc has not had any green purchasing practice related to energy since the switch from oil and coal to natural gas had been completed several years ago, and leaded petrol was phased out from Hungary. Since then, there have been few green alternatives for current energy solutions.

Green purchasing potential

The Hungarian electricity market is not liberalised, therefore the municipality has to buy electricity from the regional utility company. Liberalisation in Hungary will begin in 2002 but it will affect only major consumers. The municipality does not qualify as a major consumer of electricity. As a result, energy market liberalisation will not yet provide an opportunity for green purchasing of electricity in the next couple of years. Another option for green purchasing would be to switch from using individual gas heating to more energy efficient district heating in municipal buildings. In the case of Miskolc, however, energy efficiency of district heating is more a theoretical option rather than a practical one. This is due to the fact that the district heating company requires major reconstruction before it can realise the theoretically better energy efficiency potential of district heating in practice.

Despite this, Miskolc could facilitate the use of solar energy produced on its own or installed into municipal institutions as a part of building renovation (so far, none has been installed). It would help to further improve the local air quality as well. Recently there have been new forms of financial support introduced that could be utilised by the municipality.

Food for events

Environmental impacts

In general, food is a product group that has several sub-products. These have various environmental impacts caused during the production and processing phase, transportation of products as well as the waste impact of food packaging. These impacts are significant on the local, regional and global levels. Agricultural chemicals cause serious water pollution, pose a critical threat to biodiversity, and have a detrimental impact on human health. The environmental impact of genetically modified organisms (GMOs) is unpredictable. Agriculture is a major user of energy and freshwater as well. The food industry also discharges a significant amount of wastewater and some food additives are suspected to have carcinogen impacts.

Green product alternatives

Green product alternatives include, first of all, organic food produced without chemicals and the use of GMOs. Products from local producers - implying shorter transport distances - or with environmentally friendly packaging also present some environmentally friendly alternatives. This then results in less energy use and air pollution on the one hand and reduced waste streams on the other hand.

Green alternatives in practice

The Miskolc municipality does not maintain a canteen. School and hospital canteens are supplied independently from the municipality. This way, it is only the municipality events that are supplied with food. The variety of products served at municipal events in Miskolc includes only mineral water, pops, coffee, sugar and some biscuits. Budgetary restrictions keep expenditures in this area reasonably low. In 2000, this product group accounted for 0.09% of all purchases with expenditures of €4,690.

Therefore, the major source of environmental impact of this product group in Miskolc results from transportation of products, and also the waste resulting from the packaging of beverages. Mineral water is available both in glass and PET bottles. There is even a local source of mineral water (unfortunately only sparkling version) that is an ideal choice. Pops, however, are sold in plastic bottles, most of them are not recycled. Generated waste ends in the local landfill. Here the green option is to buy beverages of local origin whenever possible in re-cycled bottles. In case of coffee, there is no significant difference between the different products. In case of biscuits, additives and preservatives and the general recommendation of buying local products can be considered. In the case of these few products, there are no organic alternatives available.

Purchases and purchasing decisions are made by the staff of the Secretariat of the Mayor. They try to follow the instruction of the mayor to buy local and also use recycled bottles. These efforts, however, are not consequent.

Green purchasing potential

Due to the quantity purchased and the limited options of products available within the strict budgetary constraints, relief potential of this product group is small as yet. Green purchasing related to this product group, however, has a demonstrational, educational potential as well.

Furniture (desks, chairs, tables, shelves, secretariats), partition walls, doors

Environmental impacts

The environmental impacts of the product group furniture are twofold. It results in the consumption of valuable natural resources, and causes air pollution due to the chemicals used to impregnate and cover furniture surface, which is also a health hazard.

Green product alternatives

The environmental impact of the use of wood for furniture production can be diminished by using wood from renewable sources such as sustainable forestry. Air pollution, resulting from the surface treatment of furniture, can be eliminated by avoiding the use of specific chemicals in the production process.

Green purchasing recommendations also include the following:

- avoidance of isocyanides that are not technically necessary in the production process and pollute during the production and procession phase, chipboard bound with isocyanides based adhesives, formaldehyde, and other volatile organic compounds,
- opt for soap, wax, water-based lacquer or UV-curing lacquer for the surface treatment of furniture.

Green alternatives in practice

In the year 2000, the furniture purchased from the Miskolc municipal budget amounted to a relatively insignificant amount. The total spent was less than €3,000 (0.06% of total municipal purchases of products belonging to the RELIEF core product groups). The furniture purchased was for use in the offices of the municipality. At times, during the previous years, the renovation of schools and hospitals were linked with the purchase of some new furniture also. These expenditures, however, would then have been accounted for in the item “Renovation of buildings”. However, such purchases did not occur often and were not of a significant amount.

As furniture expenditures of Miskolc represent a very small amount, they are purchased in a decentralised way by departments. There has been no green purchasing experience reported.

In Hungary, eco-labels for furniture have not been issued, nor has eco-labelling criteria been developed. But this may simply be an indication that there is a lack of interest from producers in developing eco-labels, and not that there is a lack of environmentally friendly products available. As the municipality of Miskolc has not been interested in buying environmentally friendly furniture, the availability and the price of such furniture has not yet been investigated.

Green purchasing potential

Due to the insignificant volume of furniture purchases, the current environmental relief potential of this product group is irrelevant. Considering the local nature of air pollution

caused by varnishes as well as the direct impact of this pollution on human health, there would still be a medium to low environmental impact caused by furniture bought in larger quantities. As the current stock of furniture in the municipality is worn out, it can be expected that fading budgetary restrictions on furniture purchases will sharply grow, providing increasing relief potential in this product group, which should be utilized by purchasers.

IT equipment (computers, fax machines, copy machines, scanners)

Environmental impacts

IT equipment causes environmental impacts during the production, usage and disposal phases. The use of natural resources and energy in the production of IT equipment is of medium importance. These products, however, contain heavy metals such as lead, cadmium and mercury, and include plastics that pose problems in the waste disposal phase. They also include precious metals like gold, copper and platinum. From this perspective, however, there seems to be no relevant difference between products. The main difference between them is their energy consumption during use, which is also their main environmental impact.

Green product alternatives

Green product alternatives, therefore, are devices with low energy demand. The energy consumption of IT machines mainly depends on the energy use of the stand-by and sleep modes. Energy efficiency requirement of the Energy Star label of the US Environmental Protection Agency and procurement guidelines of the Danish Environmental Protection Agency are as follows (US EPA requirement in *italics,* Danish EPA guidelines in **bold**):

• computers	should power down to	*15% of maximum power usage* **max. 30 W in sleep mode, max 5W in off-mode**
• monitors		*≤15 W after 15-30 minutes of inactivity* **max 5W with USB, max. 3W without USB**
• printer and fax machines		*≤15-45 W depending on output speed* **≤6-16 W in stand-by mode depending on output speed**
• copiers		*low-power mode after 15 minutes of inactivity and to off-mode of 5-20 W after 120 minutes of inactivity* **sleep mode within 15 minutes with maximum 5 watt plus 3.85 watt multiplied by the copying speed; max. 5-20 W in off-mode (auto-off) within maximum 30-90 minutes depending on output speed**
• scanners		*≤12 W in low-power mode after 15 minutes of inactivity* **the same**
• multifunction devices		*30-200 W in sleep mode after 15-120 minutes of inactivity, depending on equipment speed* **The same requirements as for copiers for fax, copier and printer or for copier and printer in sleep mode; for fax and printer the same requirements as for printers in stand-by mode**

It is also recommended to purchase equipment with duplex capabilities (particularly in the case of medium and high speed models), fax machines that scan double sided pages, and a combination printer/fax unit.

Green alternatives in practice

Purchases are done directly by the departments that will use them unless the purchases reach a value of €20,000. The departments, similar to other IT users in Hungary, are not interested in the energy use of their equipment. Technical specifications related to energy use in active, sleep and stand-by mode, though available, convey little to ordinary purchasers, as they cannot interpret these figures. Without appropriate guidelines, even the more sophisticated purchasers disregard energy consumption when making decisions. Once again, the actual price and functions, which are most important for users, are taken into consideration.

With regards to duplex capabilities, none of the copiers and printers of the municipality are equipped with this feature as it is very costly for the small, low speed models the municipality has. (Small printers and copiers with outputs of maximum 10-15 pages/minute are used.) The duplex function increases the total cost of such machines by about 40-50%. Therefore, double-sided copying is currently done manually which is more time consuming and requires more dedication from the staff. This also results in more defected pages.

The shift to duplex printers and copiers would require a shift in price ratios, that is, in the ratio of the prices between having the duplex capability to the price of standard copiers/printers, and the price of paper. This could happen as a result of technological progress, whereby duplex functions become less expensive, environmental taxes (product charges imposed on paper), or by replacing some small, low output devices with high output, energy saving devices serving more clients. Through this change, the cost of having the duplex feature per copy, could be significantly decreased.

Green purchasing potential

Miskolc spends €66,810 on IT equipment each year. This amount represents less than 1.5% of the total purchasing expenditures, but as 93% of purchasing expenditures is spent on street lighting, renovating of buildings, and road construction and maintenance, IT equipment are ranked sixth amongst the 24 product groups. The municipality spends three times more on IT equipment than on paper. IT equipment purchases also equal more than 60% of electricity purchases.

The current municipality stock of IT equipment consists of 307 computers, 44 copiers (10 of them outdated, out of use) and 215 printers. With technological advances, new IT products are generally equipped with stand-by and sleep facilities. Copiers also switch off automatically and computers and monitors have the Energy Star label.

Considering the amount of IT equipment used, energy conscious purchasing decisions could have a great energy saving potential in the Miskolc municipality. Laser printers, for instance, use 100-200W when active. Provided, that printers are operated 3 hours per day, the difference in energy use amounts to [3 x (365-104-8)] hours x 100W= 75.9kWh (where 100W is the difference in energy use during active operation between the most efficient and the least efficient printer). For the 215 printers of the municipality (provided that all of them are laser printers) the difference amounts to an annual 16,318.5 kWh, that corresponds to €943 i.e. 2.4% of the total municipal electricity bill (0.8% of

the total energy bill). Savings would be even higher if the saving potential of computers, copiers and faxes [8], including stand-by and sleep modes, were added.

Due to the environmental impact of energy production (see sub-section on Energy) and the energy saving opportunities related to energy efficient IT equipment, IT machines have a relevant relief potential in Miskolc.

Lighting (floor and table lamps, light bulbs)

Environmental impacts

There are several indoor and outdoor light sources with different energy efficiency and environmental characteristics. Their major environmental impact is energy or electricity consumption and the related use of finite resources, the contribution to the greenhouse effect and the pollution caused by electricity generation (see section on Energy for more details). Additional impacts include the pollution due to the mercury usage in the production of energy efficient lamps, which poses pollution problems both in the production and the waste phase of the product's life-cycle. Therefore, in eco-labelling, the emphasis is placed on energy efficiency and on having a low content of mercury, as the use of mercury in lamps cannot be avoided.

Green product alternatives

In practice, this means that green purchasing options are related to the replacement of inefficient lamps with more energy efficient light sources. The highest energy saving potential is achieved when replacing worn-out incandescent light sources with compact fluorescent ones. A smaller potential can be achieved by replacing worn-out fluorescent light sources with compact fluorescent bulbs. In outdoor lighting, replacing mercury vapour lamps with high-pressure sodium lamps conveys similar positive results. These actions, while reducing the environmental impact of lighting, also provide financial savings.

Green alternatives in practice

The municipality of Miskolc mostly uses traditional fluorescents (70%) and old incandescent lamps (30%) for indoor lighting. Compact fluorescents are used only in newly refurbished clients' offices. There have also been projects when compact fluorescents were purchased and given away as social aid to poor families. This way, there are plenty of opportunities for replacement.

However, it should be noted that the savings calculated on the basis of US and Western European practices probably do not apply to the same extent to the buildings of the municipality of Miskolc. Repayment periods, in the case of Miskolc, are definitely longer than calculated for modern US type office buildings because more natural daylight and much less electricity are used for lighting. In the offices of the municipality that have sufficient daylight, operating hours are much shorter than in large office halls furnished with cubicles. In Miskolc, there are many days when lighting is not switched on at all, whilst in US style offices, lighting must be employed all the time during office hours.

[8] Calculating actual saving potential would need more data input: the structure of the total IT stock, daily use of equipment, the ratio of active use and stand-by, etc.

In the small municipal offices lighting is also adapted to individual needs and can be switched off when the employee leaves the room. This is very different from larger and more modern office rooms, where all lights are on, even if there is only one person in the hall. This flexibility is unfavourable for the duration of compact fluorescent lights that should not be frequently switched on and off.

Street lighting is produced by 21,000 lamps. In the framework of an on going project, the city plans to replace 5,200 mercury vapour lamps with high-pressure sodium lamps. Through this, €234,000 out of the total annual €1,230,400 spent on street lighting could be saved. The utility company does not want to finance the replacement, but the city is willing to borrow the money to finance the project.

For decorative outdoor lighting, halogen lamps are used, although stocks are insignificant (20-25 pieces).

Green purchasing potential

Because of the low energy consumption of in-door lighting, the environmental relief potential related to energy efficient lighting is low, despite the relevant environmental impact of energy production on the global environment. Due to the relatively high investment costs of introducing compact fluorescent lighting, and the extended repayment period (as compared to modern office buildings), significant financial savings cannot be expected from energy efficient lamps either. This way, the green purchasing potential of this product group for Miskolc is not significant. However, when considering that in most cases, environmentally friendly products are more expensive for the local government than standard products, even with slight savings compact fluorescents can be competitive with green purchasing options of other product groups. In addition, considering the demonstration effect and the relatively small amount of money spent on lighting, further green purchasing practice in this product group can be still encouraged.[9]

Due to the significant environmental impacts of generating electricity, street lighting, unlike indoor lighting, has a significant relief potential. This is a consequence of the amount of electricity required for its production and the related savings potential.

New building and renovating buildings

Environmental impacts

Renovating and constructing buildings involves a complex set of differing activities, each of these having different environmental impacts. Having said this, there are some similarities between these impacts, such as the extensive use of building materials produced from natural finite or infinite resources, use of energy through transportation of materials (see section on Energy), and the resulting waste production, which is a major component of the waste which is dumped in local landfills; the composition and environmental impact of this waste depends on the local building traditions.

Renovating buildings offers a great opportunity to upgrade existing buildings and apply new technologies that help to conserve energy and water, provide more comfort and less environmental nuisances. For instance, in the case of hospitals, renovations may include

[9] The city seems to be receptive to this idea. In the framework of the Twinergy Program titled Energy Efficiency in Public Buildings, implemented 1995-1998 and supported by EU PHARE Project, energy efficiency of three schools was improved, by introducing energy efficient lamps.

solutions to the safe disposal of hazardous medical waste. This way, renovations may result in positive environmental impacts also.

Green product alternatives

Green purchasing can help to diminish negative environmental impacts and maximise positive ones by:

- Using indigenous building materials,
- Using recyclable products and those with recycled material contents,
- Minimising construction waste and demolition debris through reuse and recycling,
- Installing water saving technologies, such as the use of grey water and water saving devices,
- Improving energy efficiency of the building by installing up-to-date insulation, efficient heating, air-conditioning and ventilation.
- Applying environmentally friendly products that are produced, used and disposed of with minimal environmental degradation.

Eco-labels are available for some of the products used in renovations but the environmental friendliness of the whole renovation project can be assessed only by adopting a piece-by-piece method. There are no simple evaluation methods for the product group Buildings, including renovated buildings. However, several guidelines have been published including some Hungarian guidelines with information pertaining to building materials available on the (Hungarian) market.

Green alternatives in practice

In Miskolc, the renovation of buildings includes renovations to residential and public buildings as well as schools, hospitals and other buildings, which were very badly neglected before the political transition. The municipality inherited from the past a significant stock of run down buildings in need of urgent renovation. While operational expenditures of municipal institutions, that is, schools, nurseries, hospitals, theatres, are independent from the municipal budget, the main expenditures of these institutions, such as renovation costs are covered in the municipal budget. This way, renovating buildings is one of the largest expenditures in the budget of the municipality. This also holds true after considering that budgetary figures related to this product group includes salaries and salary related expenditures, as projects are implemented as a service package by outside contractors.

The Capital Development Department controls purchasing related to the renovation of buildings. Due to the value of such purchases, the department is subject to public procurement regulations. So far, there have been no green purchasing activities related to the renovation of buildings. Calls for proposals do not specify environmental products and contractors are only required to meet relevant environmental regulations related to their activities. The decisions made are exclusively guided by prices. However, there have been some efforts made to give preference to contractors who take care of safe deposition of waste.

Green purchasing potential

Miskolc spent €1,064,400 on the renovation of buildings in 2000. This amount represents 21% of all municipal purchases. Renovating expenditures have been restricted by

budgetary constraints for many years now, consequently these expenditures are likely to grow. Therefore, after considering the current lack of green purchasing efforts, and the significant environmental impacts resulting from the amount of materials, energy and waste involved with this product group, there exists a high environmental relief potential in the green purchasing and recycling practices related to this group.

Paper (sheets, writing pads, post-it)

Environmental impacts

The main environmental impacts of paper arise during the production stage. They are related to wood consumption, causing deforestation and loss of biodiversity, water contamination caused by chlorine-based chemicals used in the bleaching process as well as their bio-accumulation. Other environmental impacts include water and energy consumption during the production phase.

Green product alternatives

Green product alternatives include paper made of recycled fibres, which helps to avoid deforestation, and requires less energy and water in the production process. Another approach is the elimination of the bleaching process, the third one is a combination of the first two approaches. The requirements of the German Environmental product label system, the Blue Angel, specify that the papermaking fibres of the product must be made of 100% waste paper. More specifically, there is a minimum content of low and medium waste paper grades, restrictions on the use of special chemicals, including the use of chlorine, halogenated bleaching agents and non biodegradable complex agents in the production process. The Hungarian Environmentally Friendly Product label requirements are not as strict. With regards to raw materials, a minimum of having 40% of recycled fibres from a non-chlorinated source, in the case of printing and photocopier paper (70% in case of other papers) is set. There is also a requirement that the primary fibres used must come from sustainable forests. Regarding chemical use, it sets emission standards for water and air, and requires a proper waste management policy from the producer.

Green alternatives in practice

Currently there is no paper product certified by the Hungarian Environmentally Friendly Product label, but paper certified by the Blue Angel label is available from import. Due to the low demand on environmentally friendly paper products, Hungarian paper mills are not interested in the certification system and have recently decreased the output of environmentally friendly paper. However, the mills continue to produce some non-certified products with restricted environmentally friendly characteristics that are insufficient to meet any of the existing eco-label criteria. These alternatives are cheaper than environmentally friendly paper that meets the eco-label criteria. These products are either produced via one of the following processes: from bleached recycled fibres, from non-bleached and non-recycled fibres, or containing some recycled fibres and produced with a restricted bleach usage. They can be obtained in the form of A4 copier paper and envelopes.

Table 3: Prices of Environmentally Friendly and Usual Papers on the Hungarian market

Products		Xerox Recycled, 80 g	Environmentally Friendly Paper (Szentendre Paper Mill) 80 g	Natron Paper (Szentendre Paper Mill) 70g	Normal papers
Environmentally friendly features		Made from 100% post-consumer waste pulp, de-inked without bleaching, free from optical brightening agents	100% recycled newspaper	100% made of wood, non-bleached	none
Ecolabels		Blue Angel, Nordic Swan	None	none	none
To be used with		printer, copier	Printer	printer	printer, copier
Net price/ 500 pieces	Szentendre Paper Mill, November 2001	876	825	832	1313
	Office Depot, November 2001				629-1599
	Cantel Shop Ltd., November 2001	915			940-1440
	Europapier, November 2001 (actual prices paid by the municipality of Miskolc)				620
	Ökoszolgálat	1100+0% tax			

Eco-labelled environmentally friendly paper is generally more expensive than ordinary or standard paper. An overview of the price differences is presented in Table 3.

Due to financial constraints, the municipality of Miskolc uses cheap copier paper that costs 620 Forints. As Table 3 indicates, the eco-labelled environmentally friendly A4 paper is at least 40% more expensive than this paper, which hinders green purchasing. However, purchasers of Miskolc have found that envelopes produced from environmentally friendly paper are somewhat cheaper than ordinary envelopes. These are now widely used: 95% of envelopes are made from re-cycled paper. Between October and December 2000 20% of A4 paper used was environmentally friendly paper (with the Blue Angel certificate).

Green purchasing potential

The municipality of Miskolc spends 0.33% (€16,670 annually) of total purchases, that is, purchases of the RELIEF core product groups, on paper. Due to the small quantities, the relief potential of green purchasing is limited. Measuring the environmental benefit of switching from an ordinary or standard product to a green variant on the three-grade scale, that is from low, medium to high, the impact of using environmentally friendly paper is graded medium or low. A medium grading applies if standard paper is replaced by an eco-label product, and a low grading would be given if the alternative product only partly meets the green eco-label criteria.

However, paper is a product group where green purchasing has a significant educational potential. Most people in Hungary think of environmentally friendly paper when green purchasing is mentioned. As the municipality corresponds with thousands of clients and partners, it can demonstrate its preference for environmentally friendly paper to many people and influence them in their own preferences. The municipality can promote the concept of green purchasing more easily through the use of environmentally friendly paper than, for example, white goods or IT products since the public generally does not

know what kind of IT machines of white goods are used by the municipality. Therefore, there is a significant educational potential related to the use of environmentally friendly paper. This could have a multiplication effect resulting not only in changes in the purchasing decisions of the actual municipality, but also of a wider range of users in the community.

Pens, pencils, highlighters, markers, plastic-material (overheads, folders, boxes)

Environmental impacts

Office materials is a heterogeneous product group, it also includes correcting fluid as well as toners for printers, copy and fax machines, which are in addition to the products mentioned in the above sub-title. The principal environmental impacts include:

- Hazardous chemicals used in the production of plastics, which may be released when decomposing or being incinerated or transformed into other hazardous chemicals that pollute the air, water and soil,
- Heavy metals and solvents used in felt pens, markers, glues, and correction fluids.

Green product alternatives

Green purchasing related to office materials may focus on:

- Avoiding plastics and instead using products from natural raw materials (for example, paper folders instead of plastic ones),
- Avoiding polystyrene (PS) or PVC and instead buying products that contain polypropylene (PP), polyethylene (PE),
- Using products which are refillable, for example, refillable pens (ballpoints, fountain-pens), felts and markers,
- Using water based pens, correctors and glues.

Green alternatives in practice

Purchasing of office materials in the Miskolc municipality is centralised and is done by the Organisational and Public Administration Department. This department also purchases products such as paper products and in-door lighting products. In practice, purchasing officers find it difficult to follow the above-mentioned green purchasing recommendations for several reasons. This is due to the existence of many products forming part of this product group and having various environmental characteristics. Hence purchasers need to gather a lot of information to make educated choices. Also, information on environmental criteria for office materials is rather scarce. These products are generally purchased from retail shops where staff has little knowledge about environmental criteria which should be applied. Furthermore, the size of such products makes it difficult for detailed environmental information to be displayed on product surfaces. This way, neither retail store staff nor producers assist purchasers to make environmentally friendly decisions. In addition, as many office products are not only small but are also used in relatively small quantities, the users tend to underestimate the real extent of potential environmental impacts. Consequently, there is a lack of effort made to provide environmental information relating to these products. Refills to refillable products might be out of the market, waste produced from disposal of office materials is also not taken seriously.

Despite this, Miskolc has extensive experience with refillable toner cartridges for copiers, printers and faxes. But the adoption of this practice is economically rather than environmentally motivated. Refillable toner cartridges are cheaper than new cartridges; their environmental advantage during the whole life cycle, however, has not yet been documented.

Though refilling definitely reduces waste, there are some doubts related to the quality of refilled cartridges and their impacts on IT products. Re-filled cartridges are not welcome by users as they are not as long lasting, and are said to be of poorer quality than new cartridges. In addition, the warranties of IT products do not cover products operated with non-original toners. Producers of IT equipment who also produce toner cartridges are also against refilling done by small businesses. It seems that they are not interested in the refilling options and refuse to collect empty cartridges. It is more convenient and profitable for such producers to sell new cartridges. These producers are also reluctant to co-operate with small businesses and do not assist them in producing high quality recycled products. It would take further investigations to determine whether green purchasing or legal regulations, which oblige producers to accept and reuse or refill empty cartridges, could foster the production of better quality green alternatives more effectively.

Green purchasing potential

The municipality of Miskolc spends €14,310 annually on office materials, this is somewhat less than that spent on paper. Office materials represent 0.3% of the RELIEF core product group purchases. The environmental benefit of switching to alternative green office materials is low due to the small quantities purchased and the small and diverse, mostly local environmental impacts of the production and use of this product group.

Green purchasing of office materials will not be the major thrust of municipal green purchasing policies in Miskolc. However, as environmentally friendly office materials also have a demonstrational and educational potential, though less than that of recycled paper, green purchasing efforts regarding office materials should be encouraged.

Person transport (cars, car sharing)

Environmental impacts

The environmental impacts of the use of cars are manifold. The most significant of these is the use of finite fossil fuels and their contribution both to the depletion of this resource and climate change, as well as the urban air pollution caused by the emission of carbon monoxide, VOCs (Volatile Organic Compounds), nitrogen oxides (NOx), sulphur dioxide, and particulate matter (PM). Other less significant environmental impacts of person transport include noise, congestion, and several forms of waste including that from batteries, tyres and discarded cars.

Green product alternatives

Green product alternatives of car use for person transport include public transport and bicycle transport and the use of low consumption and low emission cars. The latter are still under development, presenting an option for the future rather than the present. Nevertheless, environmental impacts of new models are generally lower than that of old models. This is unless vehicles with bigger engines and higher fuel consumption are

purchased. Consequently, replacing old, energy intensive models with new ones, can also reduce negative environmental impacts.

Green alternatives in practice

The municipality of Miskolc finances several forms of person transport services. It maintains a public transport company, supports special customised transport of disabled people and operates a small car fleet for use by the municipality staff. We will only be considering the operation of the municipal car fleet in this section. The environmental impacts of purchasing buses for the public transport will be dealt with later in a separate section. Customised transport of disabled people, on the other hand, is organised by an independent non-governmental organisation. The municipality provides some small financial support to the project but it does not buy this service in its entirety.

Despite the numerous environmental impacts and the perception of cars being one of the primary causes of negative environmental impacts, the Miskolc car fleet consisting of four cars does not create a real environmental problem for the city. Green alternatives like the use of natural gas or electricity as a fuel are not applied for budgetary reasons but the fuel consumption of the cars, according to size and capacity is appropriate to their use. Collection of tyres and batteries occurs in Hungary, although recycling of these is still an issue, which however does not affect the Miskolc purchasers.

Green purchasing potential

In Miskolc, both the environmental and economic relief potentials of municipal car transport are minimal, due to the small fleet.

Pest management, park maintenance (weed control, grass cutting...)

Pest management and park maintenance products include grass cutting, maintenance of playground toys and park furniture (benches) as well as the control of weeds, insects, and plant diseases.

Environmental impacts

The major environmental impacts caused by pesticides used in parks and green areas include soil and groundwater contamination, caused during the use and disposal phases of chemicals. Resistance to pesticides is another major concern. Air contamination and the impacts on biodiversity, along with the health hazard associated with applying the chemical is of medium importance. In addition, the production and spraying of pesticides also requires the use of energy.

Green product alternatives

The environmental effect of chemical pest management can be lessened by either reducing the amount of chemicals used (which is an application not a purchasing alternative) or by using less toxic, more selective or biological products.

Green alternatives in practice

In Miskolc, park maintenance and pest management services are procured by the City Management and Capital Development Department.

Weed control, when applied, is carried out by mechanical methods. Chemicals are used in parks, streets and public forests to control diseases, and insects. There are two major insects requiring pest management, namely the parasites of plane-trees and horse chestnut-trees. The call for tenders for these services includes the description of the

required technology without any environmental specification. The price and ISO 9000 certification are the only criteria for selecting the service provider; no environmental selection criteria are applied. The service providers use three different licensed chemicals that are effective but not enough selective: they exterminate not only the targeted pests but bees and other insects as well.

Park furniture and playground toys are maintained with paints that do not contain toxic or environmentally harmful components. Calls for tender include a list of acceptable paints.

Green purchasing potential

The environmental impact of the municipal pest management in Miskolc is low due to the restricted application area and the small quantity of chemicals used. Miskolc spends €13,640 annually for pest management, representing 0.3 % of the municipal purchases. The environmental relief potential of this product group is therefore minimal.

Control of Mosquitoes and Rats

Environmental impacts

Control of mosquitoes and rats poses an environmental problem if substances and technologies used affect not only the targeted species but also other living organisms, including humans. The use of chemicals mostly threatens other insects and in turn has a negative impact on biodiversity.

Green product alternatives

The substances and the technology employed must be very selective in its target, in order to minimise unwanted side effects. It is recommended that chemicals be substituted for biological substances and that dispensing technology be used preventing drifts or misuse of the substance.

Green alternatives in practice

Mosquito control in Miskolc is applied on about 2000 hectares. Contracts are made for the duration of one year and contractors are selected through a tendering process. In regards to the nearby national park, the municipality pays close attention to environmental aspects related to the operations. To avoid negative environmental impacts, the calls for tenders include detailed specifications on the site, schedule, and dispensing technologies, as well as acceptable substances. It also requires that preference be given to biological substances. Selection of the contractor is based on the price of the service, credentials of the contractors and the equipment used by them.

Spraying is done annually in four to six turns, according to the needs. Biological substances are used at least four times. If the result is not satisfying, additional chemical sprays are applied one to two times towards the end of the season. Spraying is done from trucks wherever possible (about 70 ha) in order to reduce the risk of drifts. Areas not accessible via roads are sprayed from helicopters (121 ha) or planes.

The biological substance used is a liquid that includes bacteria. It is the cheapest available biological substance. The substance is environmentally friendly but is prone to drifts that result in losses of the substance. It should be applied before the leaves of the water plants develop because they prevent drops reaching their target area. Using granulated substances may prevent losses, but these are three times more expensive and require more expensive technology as well. The municipality spends €31,300 annually

on mosquito control. This is 2.7 times more than it would be if only chemicals were used. Due to budgetary constraints, it is not expected that Miskolc could switch to the use of granulated mosquito control substances in the near future. The chemical substance used is less selective than the biological substance but it is easily degradable. In order to minimise negative environmental impacts, it is applied in a reduced dosage.

Organised rat control is always performed with the same chemicals applied together with baits and dispensed in boxes. It is assumed to be safe, selective and environmentally friendly. No alternative solution is available.

Green purchasing potential

The current methods employed for mosquito and rat control have been chosen after also considering their potential environmental impacts. Further reduction of negative environmental impacts of this product group would have negligible improvements.

The total amount spent on this product group was €42,500 during 2000. This expenditures represent only 0.8% of the RELIEF core product purchases but the municipalities are substantial consumers of this product group. Further investigation may confirm that the financial importance of mosquito and rat control products and services is not as negligible as first thought.

Road construction

Road construction is a composite product group that includes both the construction of new roads and the paving of sidewalks.

Environmental impacts

Road construction creates significant environmental impacts through several phases of the life cycle. Specifically, these occur during the phases of extraction and transportation of building materials, as well as the construction phase.

The major environmental impacts are caused by the material and energy intensity of road construction. This requires the use of a significant volume of building materials that are finite resources. There are plenty of minerals (sand, gravel, etc.) available, but asphalt and bitumen are valuable fossil fuel products. In addition, quarries destroy the landscape. The processing of road building minerals or the distillation of petroleum, as well as the transport of building materials require a lot of energy use. The construction phase is also very energy intensive.

Transportation of road building materials causes air pollution both through vehicle emissions and the dust and gravel dissipated from the trucks or conveyor belts. Road building also pollutes urban air with dust, PAH etc…and liquefied bitumen technologies present a risk of soil pollution.

An environmental issue of less significance is the waste generated during the construction phase, as this waste can be totally reused in the production process. Road construction, on the other hand, provides an opportunity for recycling some products that have restricted recycling options, as occurs in the case of tyres and building materials.

Green product alternatives

There are no eco-labelling criteria for the whole road construction process, however there are criteria available for some of the road building materials. Hungarian eco-

labelling criteria for road surfacing products containing bitumen[10] exist. These focus on the material and the energy intensity of the product. The road surfacing products should not contain liquefied bitumen, PAH, formaldehyde compounds or heavy metals in a soluble form. In addition, applicants have to prove that the production process produces a similar amount of emissions, or less, than that which results from the production of the standard products. Additional green purchasing options, which are not regulated by the Hungarian eco-labelling criteria, include the use of local building materials (minerals) and recycled raw materials.

Green alternatives in practice

Miskolc does not have green purchasing experience with regards to road construction. Decorative paving is probably more environmentally friendly than the use of asphalt as air pollution caused by the spread of asphalt is eliminated from the paving process. Furthermore, its maintenance is relatively easy, requiring less energy than asphalt roads. Such pavements, however, were built due to their decorative features rather than environmental considerations.

Green purchasing potential

The environmental relief potential of road construction is of a significant nature. So far, little has been done to develop road construction technologies and products that maximise positive environmental impacts and minimise negative ones. The economic importance of this product group is also significant. Miskolc spent €2,197,900 on road building in 2000. Financially, this is the single largest item amongst all purchases by the municipality.

Road maintenance (paints, lighting...)

Road maintenance includes the repairing of roads, as well as their winter defrosting.

Environmental impacts

Repairing of roads implies similar environmental issues as road construction. Winter defrosting is a separate issue, although still significant due to the cold Miskolc winters and the vicinity of the Bükk national park. The defrosting of roads is mainly done with the use of some salt, for example, sodium chloride (NaCl), sand, gravel or a mixture of these. Sodium chloride easily dissolves in water and, when washed off the road, threatens plants, pollutes the soil and underground water, and results in corrosion of nearby metal structures. Sand, when not removed, pollutes the air with solid particulates Gravel can also result in some physical damage caused to vehicles.

Green product alternatives

Green product alternatives for the reparation of road surfacing is similar to the green alternatives used for road building products. In the case where defrosting occurs, a total elimination of NaCl and the use of less damaging substances including sand and gravel are recommended.

Green alternatives in practice

In Miskolc, the defrosting of roads is currently done with sodium chloride (NaCl) and a mixture of NaCl and sand. To limit the environmental damage caused by this practice,

[10] So far, no eco-labels for road building materials were issued.

the city requires that contractors use less damaging magnesium chloride on bridges, where salinated offspring could directly pollute creeks and rivers while also affecting the steel structures of bridges. Looking for a better solution, now the city considers introducing calcium chlorine that is not washed away from roads. This is cheaper and has some additional advantages related to the application process.

A green alternative for the repair of road surfacing has not yet been considered.

Green purchasing potential

Road maintenance, with annual spending of €285,500, is one of the most significant expenditures within the budget of the municipality. Its environmental and economic relief potential is quite similar to that of road construction. In the case of winter defrosting, the adoption of an environmentally friendly solution would not only save plants along roads, but also could result in indirect financial savings associated with damage caused to shoes and cars. Hence, an environmentally friendly solution could also result in financial benefits.

Printing / layouting (advertisement or communication documents)

Environmental impacts

Environmental degradation caused by printing is manifold, depending on the technology applied. Regardless of the technology, all printed materials use paper (see section on Paper for more details). In addition, printing contributes to the following:

- water and soil contamination due to emissions of heavy metals from ink and photographic processes,
- climate change and air pollution due to emissions of VOC from solvents and cleaning agents,
- eco-toxicity and human toxicity due to the use of hazardous substances.

Green product alternatives

Environmentally friendly options for printed materials include the use of recycled paper, heavy metal (Cr, Cu, Pb, Cd, Hg, etc.) free pigments and the reduction of emissions from solvents and cleaning agents.

Green alternatives in practice

Printing in Miskolc is done by the municipality's printer shop, or contracted out.

Reports and information for the Councils are prepared by the municipality's printing shop, which uses copying technology. The exact volume concerning printing done for the municipality by the printing shop cannot be deciphered, as these amounts are included into the amount of paper and office materials bought for the whole organisation. Purchases are made by the Purchasing Group.

The figures that are available for printing relate to contract works. This includes printing and outlaying as well. During 2000, a total of seven brochures and magazines were published, amounting to € 30,800. Purchasing of this service completely neglected environmental aspects despite the fact that the municipality is aware of green products available on the market.

Green purchasing potential

Current practice demonstrates the lack of environmental criteria taken into consideration when making purchasing decisions. Switching to an environmentally friendly service provider is likely to result in positive outcomes. But, it will take further investigations to determine the extent of these, which, due to the volume of work, are expected to be minimal. The use of environmentally friendly paper, however, would have a demonstrative and educational aspect, which adds to the relief potential of this product group.

Toilet paper, napkins, hand drying

Environmental impacts

The principal environmental impacts caused by toilet paper, napkins and paper towels are similar to those occurring from the use of office paper products. Production of these products requires the input of natural fibres and energy, and also results in polluting the water surface.

Green product alternatives

There are several alternatives to the use of paper towels for hand drying. Some of these are the use of traditional textile based towels, cotton rolls, or electric hand-driers. There is no reliable LCA comparing these products, which creates difficulties suggesting a more preferred option.

In general, the green purchasing options relating to this product group are:

- Paper products from recycled fibres,
- Products with no chlorine bleaching and containing a low whiteness level,
- Purchase of reusable towels (i.e. cloth) which can be cleaned, dried and used again,
- Organisation of the collection and re-cycling of waste paper from rubbish bins (although this is not a green purchasing option but rather a green management option).

Green alternatives in practice

Miskolc follows a policy that is inexpensive and quite environmental friendly. In 2000, about €630 was spent on this product group. Cheap toilet paper from recycled fibres is purchased and the use of paper towels has not yet been introduced. Staff members use their own textile towels; some public lavatories are equipped with electric hand dryers, whilst the mayor's office is supplied with traditional textile towels that are cleaned by the municipal cleaning staff.

Green purchasing potential

This practice does not involve a significant environmental relief potential, as the quantities concerned are quite insignificant; €630 is spent annually, this is the smallest amount of all 19 product groups analysed in this report.

Toys

Miskolc procures only outdoor toys, that is, the equipment for playgrounds operated by the city.

Environmental impacts

Outdoor toys may be prepared from plastics, metal, textile and wood. They are painted, coated, lacquered and impregnated. Playgrounds may be paved with some kind of covering, other than sand (usually some rubber product), in order to diminish the impact of falling from toys. Though no scientific information was found concerning the environmental impacts of playground equipment, the following can be assumed:

- PVC and other plastics, if used to produce outdoor toys, pose similar environmental threats in the waste phase of the product's life cycle as pens, pencils and other office materials,
- paints and impregnating substances may include some hazardous chemicals, such as in the case of furniture, where lumber may be impregnated with arsenic or other poisonous chemicals that can be an issue when the toys are discarded.

Green product alternatives

As with all toys, outdoor toys must comply with several safety and health requirements. In addition, their negative environmental impacts should be minimised as well.

Hence, and based on the example of office materials and furniture, the recommendation to avoid plastic toys and be selective with paints, coats, lacquers and impregnation can be made.

Green alternatives in practice

Toys installed in playgrounds are chosen by the City Council representative of the related district. Construction and instalment operations of playgrounds are then procured through a public procurement process. It is by coincidence that the newest playgrounds in Miskolc are equipped with wooden toys.

Green purchasing potential

The green purchasing of toys could be achieved if district representatives could choose only from green products. Although this would still have a minimal relief potential due to the low quantity of toys purchased. However, despite the relatively small amount spent on toys (in 2000 this amounted to €6,440), the municipality's green purchasing practice would likely have an important impact on the market of outdoor toys, due to the market share it has.

White goods (refrigerators, freezers, dishwashers, cookers, oven)

Environmental impacts and green alternatives

As modern refrigerators do not contain chlorofluorocarbons, which have an ozone depletion potential, or substances with a greenhouse gas warming potential, the green purchasing potential is focused on energy consumption. Similarly, the major environmental impacts related to these products are their energy consumption. In the case of dishwashers, aside from their energy use, environmentally conscious buyers should consider water usage also.

Green alternatives in practice

The Hungarian market is similar to the EU market with the adoption of similar appliances and energy labelling criteria. Retail shops selling new appliances collect old freezers and refrigerators. Ozone-depleting substances are recovered and safely disposed of. The Hungarian eco-labelling specification for refrigerators also exists. Actually, the

use of eco-labels is quite popular with the producers of refrigerators. Out of the 30 products that have received the Hungarian eco-label so far, four were different brands of household refrigerators and freezers produced by different producers.

Green purchasing potential

Miskolc municipality has a stock of 48 refrigerators. The number of stoves is estimated to be of a similar amount; the municipality does not have any dishwashers or microwaves. The appliances are used for several years and replacement is not continuous. The purchasing of these appliances is done by the Purchasing Group, During 2000, however, Miskolc did not purchase any "white goods".

Due to the small stock and the insignificant volume of annual purchases, both the economic and environmental relief potential of this product group is very low.

Bus and tram fleet of city owned operator

As previously mentioned, Miskolc maintains a public transport company with a separate budget and does not have direct control on the use of the budgetary allocations. As the owner of the company, however, it has significant, although indirect, control over the company operations (including timetables) as well as on the purchasing of principal goods, such as trams and buses.

Environmental impacts

The major environmental impact of buses includes fuel consumption during operation and the related air pollution. Emissions of buses are similar to personal cars, however the emission per passenger is lower in the case of buses than in the case of cars. The major environmental impact of trams is energy use.

Green product alternatives

The use of buses that have more energy efficient engines can reduce their environmental impact. Diesel buses can be replaced by buses that use natural gas, electricity or both. Environmentally friendly trams are those that are energy efficient.

Green alternatives in practice

The Miskolc transport company fleet consists of 205 buses and 35 trams. The city encourages the public transport company to operate in an environmentally friendly way, to save energy (and related costs), reduce pollution caused by vehicles and to introduce EMAS. The company is a good partner in these efforts. Within the budgetary constraints, there have been efforts to replace outdated buses with modern ones meeting EU requirements. So far, 8 buses have been replaced with new ones meeting the Euro III standards and further purchases of 68 similar ones are anticipated.

Environmental Green purchasing potential

Due to the importance of public transport usage in Miskolc, as well as the low share of low emission buses and energy efficient trams in the municipal fleet, the relief potential of replacing outdated models with new ones is very significant. Expenditures related to the purchase of new vehicles are also considerable. The Miskolc Transport Company spent €1,500,000 on new buses in 1999, the purchase of 68 buses in 2002 is expected to be close to €12 million.

Financial valuation of product groups

Environmental impacts related to purchases depend both on the environmental characteristics of the products purchased as well as their quantities. These quantities are indicated by the amounts spent on each product group. An analysis of these expenditures has another objective. It can be assumed that the more is spent on a product group, the more potential the municipality has to influence the market.[11]

In 2000, Miskolc spent **€5.1 million** in total on the purchases of the core product groups studied in the framework of the RELIEF project.

The financial data source has been the municipality's accounts. Based on the product specifications and definitions prepared by scientific partners, detailed instructions what items should and should not be included in each product group were compiled. These instructions were given to the financial department of the Miskolc municipality. Based on these instructions, the financial department of the municipality calculated the actual amounts spent on each product group. The department was asked to signal if any of the definitions were unclear or if they had any difficulty with the calculation, but no inquiry or comments were made.

Nevertheless, some conflicting figures were identified with the help of interviews made with municipal officials. This conflicting data was investigated further and cross-checked. A summary of the expenditure for 2000, related to the various product groups, and their share of total expenditures on core product groups is presented in Table 4.

Table 4 shows that there are three financially particularly relevant product groups for the Miskolc municipality: "Road construction", "Street lighting" and "Renovation of buildings". These product groups represent approximately 90% of all municipal purchases. In addition to these three product groups, only "Road maintenance", "Energy" and "IT equipments" have a larger than 1% share of the municipality's purchases. The remaining product groups represent less than 1% of total purchases. That is, these are regarded as financially irrelevant, in terms of potential to green the market via green public purchasing.

In 2000, there were no new bus purchases in Miskolc, as was previously mentioned. Expenditures relating to the purchase of buses when they occur are comparable to the expenditures of road building.

[11] The correlation between expenditures and market influence, however, are not very strong, hence the rough financial analysis done in this sub-section cannot replace a detailed market analysis that will be done in the next phase of the RELIEF project.

Table 4: Financial Valuation of Product Groups

Product group	Expenditures in 2000		% of	
	thousand HUF	thousand EUR	purchasing expenditures	total city budget
Cleaning products or services	1,815	7.09	0.14	0.01
Energy (electricity / heating)	27,620	107.89	2.10	0.10
Food for canteens and events	1,200	4.69	0.09	0.00
Furniture	762	2.98	0.06	0.00
IT equipment	17,103	66.81	1.30	0.06
Lighting	493	1.92	0.04	0.00
Outdoor (street) lighting	315,000	1,230.47	24.01	1.15
New Buildings	0	0.00	0.00	-
Paper	4,268	16.67	0.33	0.02
Pens, pencils, highlighters, markers, plastic-material	3,662	14.31	0.28	0.01
Person transport+ petrol	7,839	30.62	0.60	0.03
Pest management	3,492	13.64	0.27	0.01
Control of mosquitoes and rats	10,879	42.50	0.83	0.04
Printing / layouting	7,900	30.86	0.60	0.03
Renovating Buildings	272,500	1,064.45	20.77	1.00
Road construction	562,668	2,197.92	42.88	2.06
Road maintenance	73,104	285.56	5.57	0.27
Toilet paper, napkins, hand drying (hot air, paper, textile)	161	0.63	0.01	0.00
Toys	1,649	6.44	0.13	0.01
White goods	0	0.00	0.00	-
Sanitary and water heater	0	0.00	0.00	-
Total	1,312,114	5,125.45	100.00	4.80
Bus and tram fleet of city owned operator (purchased outside of the budget of the municipality)	0	0	0	0
Total city hall purchases in 2000	1,312,114	5,125.45		4.80
City hall budget in 2000	**8,172,000**	**31,921.88**		29.91
Budget of Miskolc in 2000	**27,323,000**	**106,730.47**		100.00

Table 5: Overview of Environmental and Economic Evaluation of Product Groups

Product groups	Environ-mental impacts	Availability of green options*	Relevant green purchasing options	Green purchasing experience	Financial impacts	Special considerations
Cleaning products	Low	Yes	without specific components (e.g. chlorine)	Little	Low, negative	
Energy (electricity /heating)	High	Yes	alternative energy, energy efficient heating systems	None	High	
Food for events	Low	Yes	products in recyclable bottles	Little	Low	demonstrational, educational impacts
Furniture	Low	Yes (+)	no isocyanides, formaldehyde and other VOCs	None	Low, negative	
IT equipment	Medium	Yes (+)	energy saving devices	None	Medium, positive	demonstrational, educational impacts
Lighting	Low High	Yes (+)	indoor lighting, compact fluorescents outdoor lighting, switch to high pressure sodium	None None	Low High, positive	demonstrational, educational impacts
Paper	Low Medium	Yes	paper from recycled fibres, non-bleached less rigorous environmentally friendly option	None Little	Low, negative	demonstrational, educational impacts
Pens, pencils, etc.	Low	Yes	refillable pens, pencils without lacquer, no plastics	Little	Low, negative	demonstrational, educational impacts
Person transport (municipal car fleet)	Low	Yes	low emission cars	None	Low	
Pest management	Low	Yes	selective, easily degradable compounds	None	Low	
Control of mosquitoes and rats	Low	Yes	biological control, less toxic, selective, degradable products	Yes	Medium	significant market share
Printing, layouting	Low	Yes	use of recycled paper, non-toxic inks	None	Low	demonstrational, educational impacts
Renovation of buildings	High	Yes	local building materials, recyclable products, re-use and recycling, promoting water and energy saving	None	High	
Road construction	High	Yes	no liquefied bitumen, PAH or formaldehyde	None	High	significant market share
Road maintenance	High	Yes	no liquefied bitumen, PAH or formaldehyde	None	High	significant market share
Toilet paper, napkins and hand drying	Low	Yes	paper products from recycled fibres	Little	Low	demonstrational, educational impacts
Toys	Low	Yes (+)	no plastics, natural surface treatment	None	Medium	significant market share
White goods	Low	Yes (+)	energy efficient appliances	None	Low, positive	
Bus and tram fleet	High	Yes (+)	energy efficient, lo emission vehicles	Little	High	significant market share

* Yes – available, Yes (+) – easily available, Yes (-) - limited availability

Conclusions

Since the political transformation, Miskolc has had important environmental policy initiatives to remedy previous environmental problems and provide a healthy, attractive and liveable living environment for its citizens.

Introducing a green purchasing policy is a new initiative which has already had partial results; the municipality had some green purchasing experience with six of the nineteen core product groups studied in the framework of the RELIEF project. These purchases, however, were made by sporadic, non-integrated decisions.

In order to extend existing green purchasing practices, the city has to cope with several external hurdles including the relatively high prices of green products and the lack of information on the environmental specifications of different products. In addition, it has to address internal hurdles, such as the lack of a concrete green purchasing policy as well as perceptual and institutional barriers.

Developing and adopting a green purchasing policy is the next step for Miskolc. Adopting a green purchasing policy is a demonstration of the Council's commitment. This policy could set goals (for example, which percentage of the total purchases should green products and services represent and how much resources can be used for green purchases), identify priorities, assign responsibilities and provide strategies to overcome external and internal hurdles. The municipal green purchasing policy should also outline how much additional funds can be used for environmentally friendly products, if any. Furthermore, this policy should specify what product groups should be focused on and where environmental friendly alternatives also provide additional economic benefits, compared to those of standard or ordinary products; for example, where products assist in energy savings, reduce operational expenses or save waste disposal capacity.

The issue concerning the scarcity of such information can be addressed by the development of local green purchasing guidelines that could be used by purchasers when making purchasing decisions. If developed, these should be updated on a regular basis. Institutional barriers and the lack of concentrated procurement processes can be resolved through the adoption of new institutional arrangements and procedures. Perceptual hurdles could be overcome through the provision of adequate information via training and publications.

The results of the environmental and financial evaluation of the green purchasing potential of the product groups are summarised in Table 5.

There are six product groups with high environmental impacts including energy, street lighting, renovation of buildings, road construction, road maintenance and public transport buses. These groups present the first cluster of product groups. All of these are energy intensive products, and all are purchased in significant quantities, which increases their environmental relief potential. In each case, there are some green product options, although not always obvious or easily accessible, and there has also been no green purchasing practices related to these product groups, with the exception of buses. The municipal green purchasing strategy should therefore first address these product groups and then develop strategies for the introduction of related green purchasing.

The remaining product groups result in less significant environmental impacts either because these impacts are of a less harmful nature or due to the small quantities

purchased or because the current practice already involves some green elements, hence further improvement results in a lessened relief potential.

Some of these product groups still have an important green purchasing potential. This is due to various reasons. In the case of some product groups, green purchasing of the municipality can have a demonstrational or educational impact. In other cases, the municipality is a significant consumer of these products with a significant market share. The green purchasing potential may also arise from an easy access of the city to green product alternatives. Thus, the municipal green purchasing policy should provide special consideration to this second cluster of product groups.

The most important product groups in the second cluster are IT equipment and toys, as they provide the best opportunities for green purchasing. Both IT equipment and toys are of medium financial importance, have readily and easily available green product alternatives and have a demonstrative impact. Paper, office materials, mosquito and rat control, printing, furniture, food for events and toilet paper have a somewhat lower relief potential, but are still of importance, and therefore have priority over the product groups of the third cluster.

The final cluster, with lower relief potential, includes cleaning products, person transport, pest management and white goods. There are feasible green purchasing policies related to these product groups, but the expected environmental impacts are less significant than those of the above mentioned product groups. As a result of this, the inclusion of these product groups into the municipal green purchasing policy will depend on the availability of financial, human and institutional resources.

References

Füzesi, Zsuzsanna – Tistyán, László (1998): *A környezeti tudat alakulásának elemzése a rendszerváltozás óta eltelt időszakban.* (Analysis of the Change of Environmental Awareness since the Beginning of the Transformation) Manuscript.

ICLEI European Secretariat (2000): *Buy Efficient – Public Procurement and Energy Efficiency.* Results of the European Expert Workshop Strasbourg, France, September 2000

ICLEI (2001): *The World Buys Green.*

Környezetvédelmi Minisztérium (2000): *Pályázati Tájékoztató a környezetbarát, környezetkímélő megkülönböztető jelzés minőségtanúsítási rendszeréről és a védjegyhasználat feltételeiről* (Ministry of Environment, *Information on the Quality Assurance System of Environmentally Friendly Products and the Conditions of the Use of the Eco-Labels*).

Környezetvédelmi Szolgáltatók és Gyártók Szövetsége (Association of Environmental Manufacturing and Service Companies): XIR Database, at www.kszgysz.hu/xir.htm

RELIEF – European Research project on green purchasing, ICLEI website at http//:www.iclei.org/ecoprocura/relief.

ÖKOTÁRS Foundation (1998): *Mindennapi bevásárlásaink - zöld szempontból* (Daily Household Shoppings from a Green Aspect), Manuscript.

US EPA: *A Buyer's Guide to Purchasing Energy Star –Compliant Office Equipment.* http://www.epa.gov/nrgystar/purchasing

Zsótér, Gabriella (2000): *Környezetbarát iroda kézikönyv* (Environmentally Friendly Office Manual). KÖVET-INEM Hungária, Budapest.