

Waste Treatment within Small and Medium Sized Enterprises and Proposals for Improvement

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ABSTRACT

Small and medium-sized enterprises (SMEs) play an important role in many economies around the world and are vitally important for a health dynamic market economy. Collectively, SMEs also cause significant impacts on the environment by their activities, products and services. The present situation, when SMEs are unaware of their environmental impact, can pose an important threat not only to the environment but also can have a negative effect on worker's health and safety. The main research questions of our study were: do entrepreneurs performing craft activities, have the necessary knowledge to carry out their waste management activities and environmental performance in general, and what possibilities for better waste treatment, waste minimization and reduction can be offered to SMEs and how? The results supported this hypothesis are that the level of knowledge about their responsibilities according to the regulations among many SMEs is still low. In the future, it will be crucial that public authorities and other key players support SMEs in increasing their efforts for improvement.

KEYWORDS:

Craft, Environmental impact, Small and medium-sized enterprises (SMEs), Waste, Waste management.

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The total environmental impact of small firms is not known either at national or regional levels, but according to some surveys about 70 % of all industrial pollution is contributed by SMEs.

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INTRODUCTION

A great share of the businesses in Slovenia and European Union is small, representing some 99 % of all enterprises, 57 % of economic value added and about 66 % of total employment. Based on the definitions micro, small and medium-sized enterprises is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million Euro, and/or an annual balance sheet total not exceeding 43 million Euro [1].

The Law of Craft defines that a craft activity is a profit oriented activity being divided into craft activity, activity similar to craft and activity of home craft and applied arts being performed by self employed persons, an economic company or a craft collective. An individual person can perform a craft activity for which certain qualification requirements must be fulfilled and on the basis of craft permission and registration in the craft register [2]. The Slovenian craft with 52,109 craft enterprises and over 150,000 employees represents an important part of the Slovenian economy and the bulk of craft enterprises are SMEs, according to definition above. Special categories in the Slovenian craft are definitely craft enterprises without employees, which represent 55,4 % of all registered craft enterprises [3].

The total environmental impact of small firms is not known either at national or regional levels, but according to some surveys about 70 % of all industrial pollution is contributed by SMEs. The problem is not so much in individual firms, although in some cases there can be serious individual impacts on the local environments and communities, but rather in their combined total impact across sectors [4].

Over the years, worldwide concern for the environment is getting bigger attention. There are clear signals that wide industrial sectors are moving towards cleaner production processes, in order to respond, among other factors, to climate change imperatives. Industrial activities which cause an environmental pollution has been bounded to more comprehensive and effective environmental schemes or legislations (such as the IPPC Directive, the Directive on the Emission Trading Scheme), while SMEs often fall below the thresholds that trigger the application of instruments that concentrate on major individual sources of pollution. In cases, where environmental legislation is applicable to SMEs, they tend to presume that they are complying and, as a result, full compliance is often the result of external action after an inspection rather than an on-going process of checking that legal requirements are actually being met [5]. At the same time, SMEs often do not have the necessary legal and environmental expertise to cope with environmental legislation.

SMEs are responsible for the waste generated within their business; from when it is produced until they have transferred it to an authorized person. The field of waste treatment within crafts is well regulated. Slovenian environmental policy has been based on the Waste Management Decree, and has been harmonized with the corresponding Euro-

pean Union's legislation. The amount of waste produced is usually lower than it is within the industry sector, but nevertheless the heterogeneous and diverse nature of the craft sector makes it difficult to generalize about the environmental impacts and strategies of the sector. Some of the empirical literature shows that the majority of SMEs have little awareness of the environmental impacts and how to manage them. Most of them (between 75 % and 90 % according to some surveys) think that their activities do not have any impact on the environment. Therefore, most of them have not introduced any practical measures to reduce their environmental impacts [6].

SMEs usually do not have any employees dealing with environmental issues, so this remains the duty of the managing director or the business owner who also handles all other activities of the enterprise. It is hard for them to comply with environmental legislation. Actions are usually taken in order to avoid costs, but not at the expense of environmental protection [7]. Environmental planning, if any, in most cases is only of a short term and is applied as necessary. Sometimes companies have difficulties in understanding how the legislation affects them, which is accompanied by poor knowledge about their responsibilities according to the regulations; separating hazardous and special waste from others, false treatment and storing, keeping records and the awareness that these responsibilities have no time limit.

If SMEs are unaware of the environmental impacts of their own activities, and of the environmental legislation that applies to them, their activities could present an important threat for the environment. The environmental impacts of SMEs which are associated with low awareness and low legal compliance could also have the effect on increasing health and safety risks of workers. And at the end they can miss the chance to reap the economic benefits of the opportunities presented by better environmental management and eco-innovation [7].

The main hypothesis of this research work was that the majority of SMEs have little awareness of their environmental impact, particularly within the waste management operations, which makes them problematic in terms of compliance with environmental legislation. Through the research work we wanted to find out what is the level of knowledge about environmental requirements, waste and hazardous waste, waste minimization, and waste treatment in general between SMEs. We also wanted to find out how to provide possibilities that are not connected to high costs and investments for better waste treatment? By the help of questionnaires, interviews and on-site visits it has been endeavored to analyze the current situation, regarding how craft shops are dealing with waste and hazardous waste generated within business.

The study identifies some proposals for waste management improvements within SMEs starting with the prevention of waste generation in the first place. Also some other measures and tools to help SMEs to comply with the legislation and to improve their environmental attitude were identified.

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The results consist of data collected through the analysis of returned questionnaires and of data collected from on-site interviews.

METHODS

The main objective of the study is to identify some proposals for waste management improvements within SMEs, starting with the prevention of waste generation, and other measures and tools to help SMEs to comply with the legislation and to improve their environmental attitude. The empirical part of presented work included a desktop research, which was in May 2008, continued with analyzing the questionnaires sent randomly using the data from the Craft Register [8], to 300 entrepreneurs who are members of the Chamber of Craft and Small Business of Slovenia from the section of maintenance of textiles and car services. The survey also included an on-site visit along with interviews conducted with some SMEs. The results consist of data collected through the analysis of returned questionnaires and of data collected from on-site interviews. The response rate was about 40 % and lower than had been anticipated, particularly from the car service section. There were 21 questions in the questionnaire; most of them were fixed-choice with two, three or more possible answers to select. In the introduction, it was asked about their core business and number of employees. It was continued with questions about quantities of waste and hazardous wastes produced per year, collecting and separating wastes at source, storing and recycling. It was foreseen that SMEs do not have full awareness of the legal requirements associated with their operation, so asking them about being aware of the demands of legislation. The questions following referred to specific waste treatment procedures which

Table 1:

Main themes of the interviews.

Waste and waste management within business: Actions to meet legislation and complying with legislation. Waste treatment within the business. Waste minimization, recovery, recycling. Removal by authorized person, disposal. Keeping the necessary documentation.
Awareness of environmental impact of the business: Is there any impact and what kind of? Responsibility towards the environment. Reducing environmental impacts. Environmental planning.
Environmental inspector visits: Supervisions within last five years. Measurements set down by the inspector. Improvements after the visit?
Need for further information and better advice: How, what? Guidance.
Motives to build up an EMS: Improvements regarding environmental issues. Willingness for on-going efforts. Short term plan to implement ISO 14001, EMASeasy. Expected benefits, obstacles.

are performed by each SME, such as: costs which appear yearly for hazardous and non hazardous waste treatment, having waste documentation as a waste management plan according to the Decree on waste management, who is involved in environmental issues, where do they usually get information and necessary knowledge and skills to comply with environmental issues, do they need additional education, do they have any controls and examinations by environmental inspectorate in their crafts units and finally, what measures were given, if any.

Interviews and on-site visits were meant as continuation work after the survey. Interviews were performed in May 2009, in selected companies within two businesses: car section, and textile maintenance 2009. The interviewing method was not based on a formal schedule of questions but the researchers had a list of selected themes for the discussion. On-site visits have followed the interviews and helped to better understand the situation and problems appearing within SMEs.

Main themes of the interviews with managing directors-owners as interviewee are listed in the Table 1.

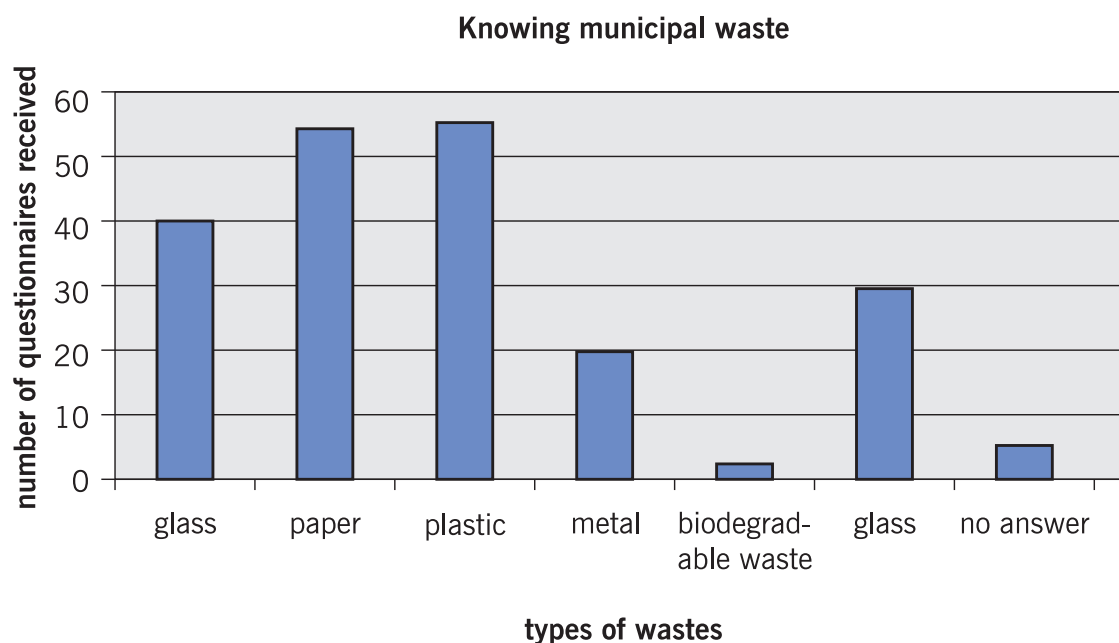
RESULTS AND DISCUSSION

The results of this study clearly showed that SMEs in general are very passive in environmental protection and that they primarily follow the development of tightening legislation. Actions taken are usually in order to avoid costs, not for sustainability or environmental protection. They often do not deal with environmental planning but if they do, planning is only for the short term. There are still some entrepreneurs who feel limited responsibility towards the environment. They often think they are small entrepreneurs and that their contribution towards environmental impacts is negligible. Sometimes, even if they were familiar with some options to improve their environmental attitude, there was no action taken because there was no willingness and positive aspiration to comply.

The results of the study showed that we are dealing with very small entrepreneurs (average number of employees is 3.1 with owners included), which are generating wastes and hazardous waste. A high percentage of those asked – 34 % – do not assort waste and dispose of the municipal waste, and from the answers which followed, it was clear that the knowledge about waste treatment is generally low. The Figure 1 shows different types of wastes which were stated as most common by entrepreneurs. It is obvious from the results that the surveyed entrepreneurs do not know enough about municipal wastes they listed only a few types of waste, in spite of the previous question in which many of respondents – 62 % – affirmed that they know about the municipal waste. They were asked which hazardous wastes have been generated within their business? Answers given by participants performing textile processing showed that they know their hazardous waste very well, while answers received from participants of the section of car services showed that they know only few of the hazardous wastes generated

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**Figure 1.**

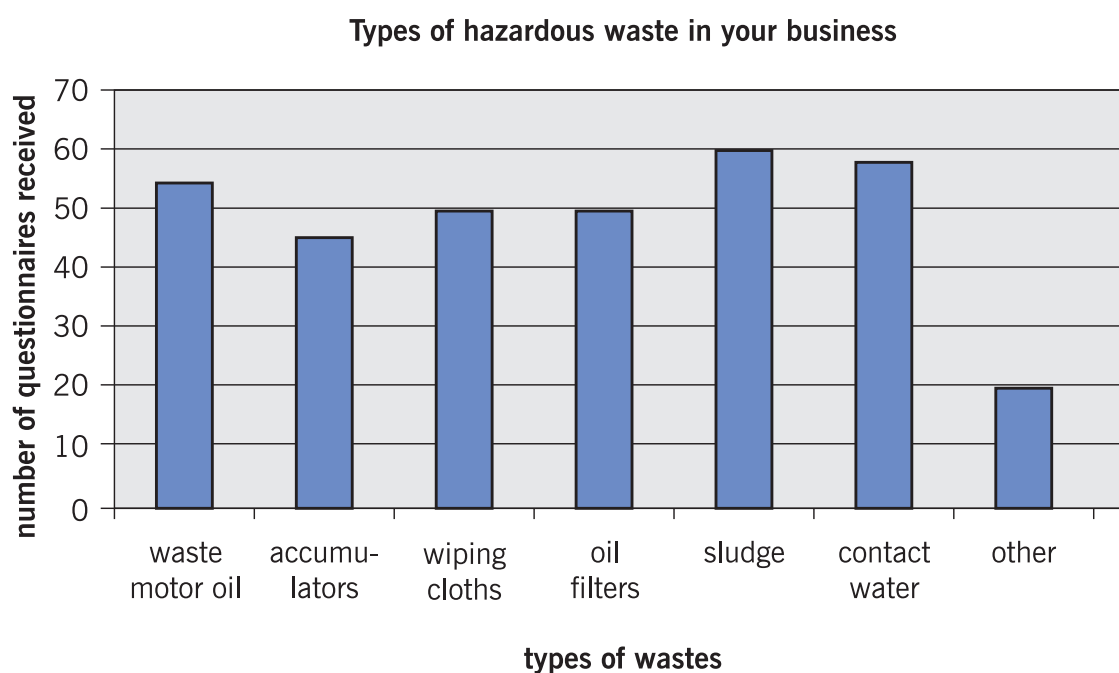
Specify the municipal wastes which are being collected and disposed separately.

within their business (Figure 2). Mechanics are less aware of hazardous waste generated, even if there can be different types which can cause mismanagement with hazardous types of waste and pose a threat towards the environment and also to human health.

Figure 2.

Which hazardous wastes are generated within your business?

Only 10 % of the entrepreneurs surveyed generate less than 200 kg/a of hazardous waste and are consequently not obliged to prepare the waste management plan. But the following answers showed that more than 30 % of respondents thought they are not obliged to have the



plan. During the on-site visiting we noticed that some SMEs had a plan but had not cooperated when it was prepared. Unfortunately, the documentation prepared by an external company dealing with the environmental issues, usually stays in a drawer and the goals defined in documents are not followed.

Hazardous waste, according to the survey results, are collected separately in a high percentage, but there is almost no incentive to produce less hazardous waste. As was already foreseen, that none of the interviewed has the position of environmental officer. When we asked about the responsibilities for waste management, more than 70 % said that it is the duty of the owner of the company. This was an expected and important finding, since these positions are very demanding and usually they have no spare time for topics which are not directly connected to business.

Almost 66 % of the participants (Figure 3) have not taken any measure to generate less waste which shows their passiveness towards environmental issues and little incentive to introduce waste reduction and minimization within the business.

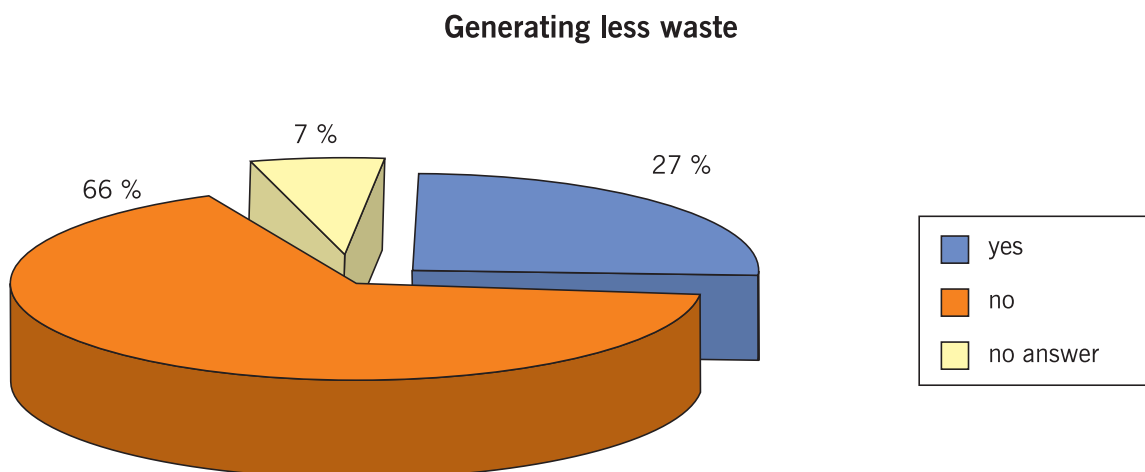
More than 90 % of entrepreneurs stated that they do not recycle waste generated, which shows their passiveness towards the environment (Figure 4). The following questions about temporary waste collection showed that SMEs are using many wrong disposal places, which can be a threat either to human health and/or towards the environment.

More than 60 % of SMEs have not had supervision from the inspectorate within the last five years. It is known that many of the obligations from legislation are not followed and fulfilled until the inspectorate pays a visit and stipulate the measures. From the available data [9], it is clear that a great share of entrepreneurs seek help of the Chamber's consultants after receiving a visit from the inspectorate, stipulating the required measures. One of the entrepreneurs included in the survey,

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Figure 3.

Do you try to generate less waste?



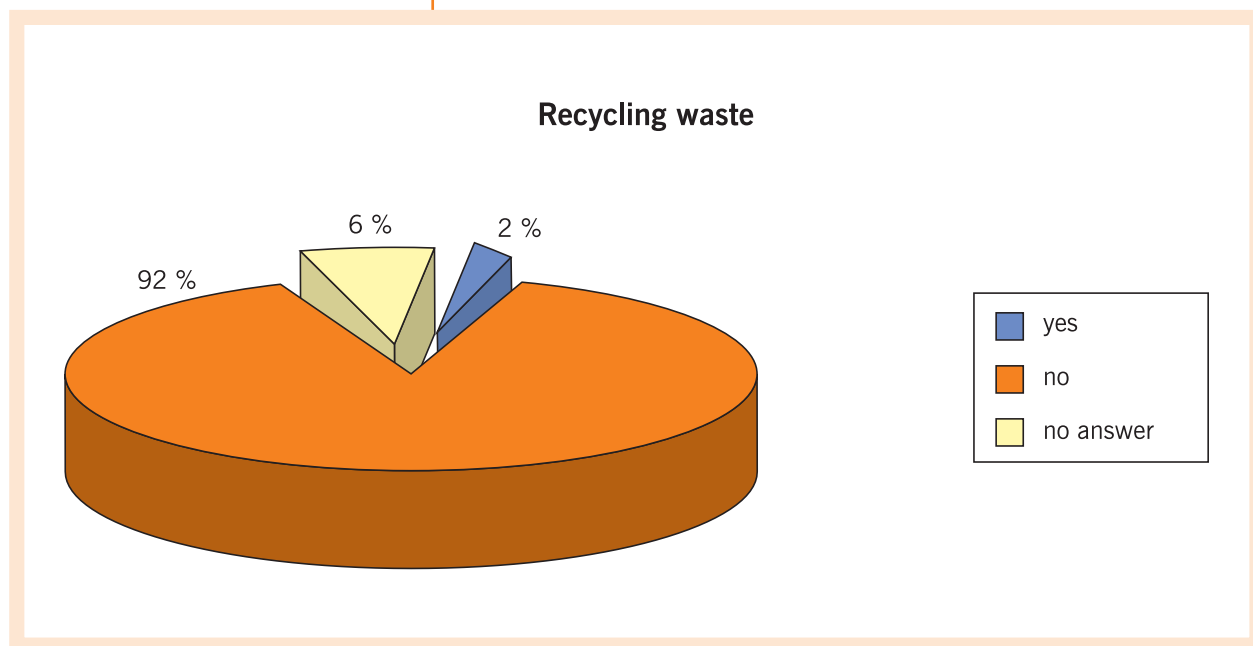


Figure 4.

Do you recycle the waste generated within your business?

From the results of the survey it was also noticed that SMEs are not familiar with simple on-site operations to reduce, reuse the waste, likewise they do not recycle wastes as they should.

that he was fined with a penalty since he was not separating wastes and hazardous waste according to the legislation. It is clear that actions such as inspections are insufficient to ensure compliance and permanent change in behavior among SMEs since the mismanagement in the same company within on-site visit was noticed.

They were also asked whether they have enough information for the proper waste treatment and almost 50 % of entrepreneurs included in the survey answered negatively answered that and are willing to acquire additional knowledge. From the results of the survey it was also noticed that SMEs are not familiar with simple on-site operations to reduce, reuse the waste, likewise they do not recycle wastes as they should. The need for better advice and additional educating was clearly expressed in the survey. Answers from the survey give good reasons for initiating the process of improving their waste management and environmental performance.

None of SMEs included in the on-site interviews has acceded to environmental planning or to take any proactive steps to improve their waste management. Most of the activities are taken in order to avoid costs, while hardly following the legislation. Many SMEs surveyed have not realized that separate and proper waste collection can increase the value of the waste; there are some opportunities for costs reduction, such as waste packaging or other forms of disposal.

CONCLUSIONS

The nature of wastes from SMEs is very heterogeneous; often there are several locations of waste origin which makes it difficult to generalize about the environmental impacts. That makes them a particularly problematic group in terms of complying with the legislation. SMEs, compared to larger firms, are unique in their heterogeneous nature and are fighting for their existence; occupying positions in most of the surveyed

companies do not include environmental activities. That makes entrepreneurs vulnerable, and the lack of human and financial sources leads to low or non environmental planning, difficulties in understanding how legislation affects them, about their responsibilities determined by regulations, how to separate hazardous waste and special waste from others, where to put waste generated, how to collect temporary waste, to fill in and keep the documentation and the awareness that the environmental responsibilities of the polluter have no time limit.

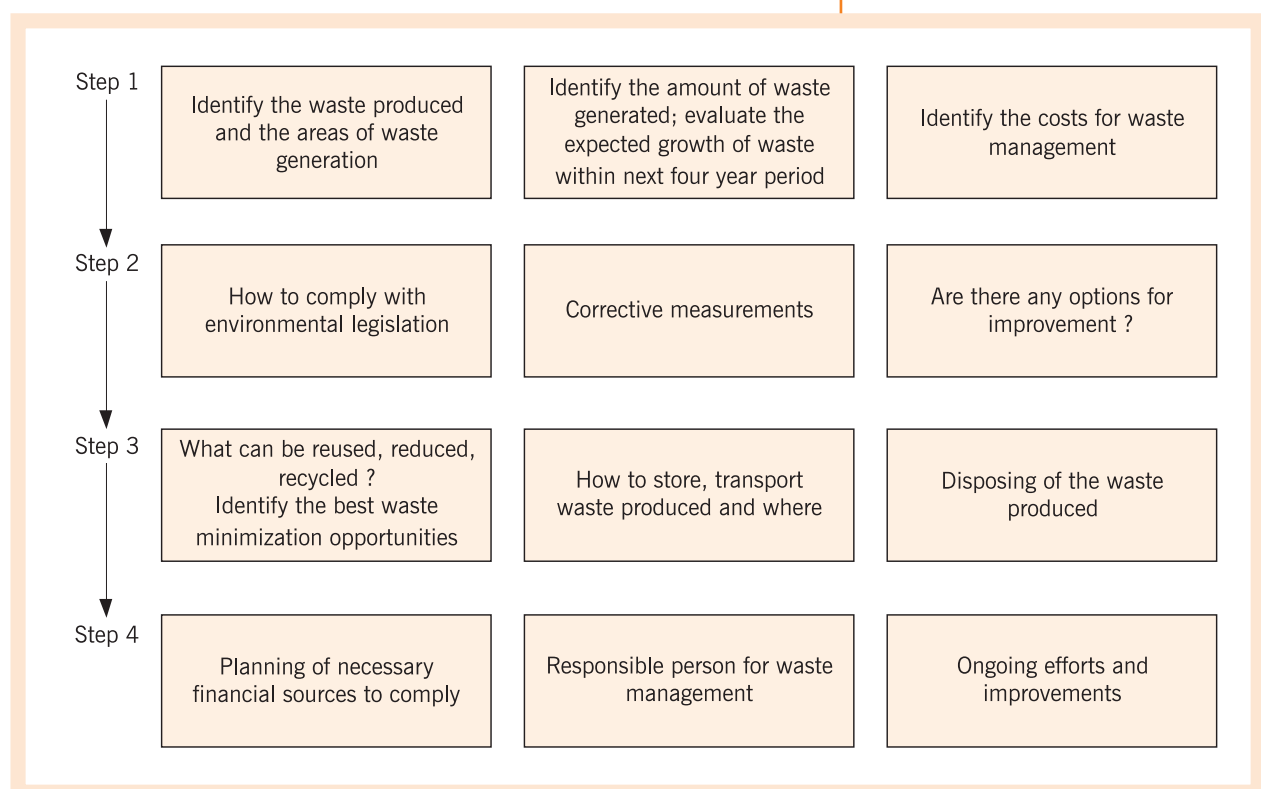
Several methods to help SMEs to improve their environmental performance, particularly in the field of waste management were found. Many different options were taken into consideration to improve the waste treatment, to minimize the amount of waste and to reduce their hazardousness.

As a very important finding from the survey it was exposed and considered that SMEs suffer from a lack of legislation awareness and necessary know-how. If people who run the business are not complying with the legislation, it results in present mismanagement. All the key players should actively seek how to fill this gap successfully and to forward the necessary knowledge. Only SMEs who are aware of what the legislation demands are, can take actions to comply and thereafter to make a break from an old traditional approach and to adopt a proactive approach to environmental management of the business and consideration of environmental issues as an insignificant theme. A modern approach should be proactive, also with the environmental planning as stated in the Figure 5.

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Figure 5.

Schematic Approach to environmental planning.



Waste recycling operations that would take place within SMEs are not appropriate solution, when taking into consideration the recycling warranted from the point of economy and environmental protection.

Conclusions made after the survey offer a set of proposals for improving environmental performance:

- SMEs need additional knowledge and know-how to improve their environmental attitude; this can be achieved through preparing on-going seminars, round tables, branch meetings with environmental themes discussed, etc.
- Concrete solutions through technical and organizational measures have to be prepared: how properly treat the waste generated, the possibilities for waste minimization on-site, how to reduce the amounts of hazardous waste, how to reuse, recycle and recover, and follow instructions for proper temporary waste collection. Waste recycling operations that would take place within SMEs are not appropriate solution, when taking into consideration the recycling warranted from the point of economy (costs would be significant where the amounts of wastes are small) and environmental protection. But what entrepreneurs can successfully do is to take care that wastes are collected and separated in a way that further *procedures* such as recycling are possible. It also has to be stressed that every employee has to be educated and motivated to take care. Since these are SMEs with only few employees, the proposals stated will only work successfully if everyone in the company is familiar with and engaged in the process of proper waste treatment, not only the managing director. There were no companies in the site visiting which would have a staff member responsible for at environmental performance issues. This fact probably would not change in the near future (unless legislation changes) from the point of costs. The duty of owners is to change consideration of the environment as a peripheral issue and to give a good example to everyone else engaged in business. This form of help should be assured to as many SMEs as possible. For this purpose a unique web site will be completed (by the Chamber of craft and small business of Slovenia) containing all important data on environmental issues by for different businesses and topics, tackling the entrepreneurs starting a business or already working.
- Assistance for SMEs has to be assured and strengthened through their supporting organizations such as chambers, nongovernmental organizations, waste carriers in order to offer better advice, and tailor made advice from knowing the uniqueness of each business.
- The role of government should not only be in making regulations but also in encouraging SMEs to improve their environmental attitude and waste management by participating in and implementing voluntary programmes such as cleaner production, ISO 14001, EMAS (Eco-Management and Audit Scheme), EMASeasy (a lean and standardized methodology for small and micro businesses, based on the Eco-mapping® concept) [10] and eco-label. By all expressed measurements, government has the goal to cut the red tape and to simplify the existing legislation where possible. Government is obliged to stimulate the adoption of voluntary programmes with fairer fees and

to enable more support, but there arises the question of whether SMEs are ready to take such a big step. Probably it is too soon to think about that at least for the smallest companies which have been now fighting to overcome the crucial gap in know-how and knowledge. But yet, the EMASeasy is an excellent tool also in developing environmental understanding-what many entrepreneurs need to be able to assure environmental compliance.

In order to achieve successful waste treatment and to ensure lasting benefits, merely complying with the regulations as a traditional way of approach towards the environment is not enough. We have to develop new approach based on co-ordination of certain key players by changing the companies' culture towards a more environmentally responsible, to engage actively in improving their environmental performance and their ethos, whatever their size or business is.

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