

Environmental Waste Management in Constructions

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Abstract

The article focuses on the issue of environmental management in constructions. Construction Waste Management is a part of a growing movement toward a sustainable world. Recycling and reuse of materials have long been associated with wise construction practices. Recycling, reusing, and salvaging construction waste can save money. The role of the manager of construction systems is to direct to and guarantee reduced pollution and also to prevent the negative effects of the environmental pollution.

Key words: constructions, environment, waste, management, recycling

1 Introduction

Construction, one of the oldest activities of mankind, has an important effect on the social-economic development and at the same time sets an indelible seal on the surroundings and the environment. It influences the economical dynamics of society and also has an important effect on the environment and surroundings. That's why it is very important to implement the Environmental Management System in constructions. The activities connected with constructions have long-term effects on the change in appearance of a region, as well as on natural resources and Waste Management. The current environmental policy is based upon the concept of Sustainable Development. The latter has been gaining increasing importance both in the international community and the Member States of the European Union as a form of development bringing prosperity to future generations. It fosters the prevention and mitigation of pollution at source and emphasises sound use of natural resources as well as preservation of biodiversity. In the environmental

sphere, Sustainable Development is understood as an interdependent relationship between the economy, infrastructure, settlement and the way of living, taking into consideration the bearing capacity of the environment and natural resources. [1]. It is inevitable that Sustainable Development becomes one of the values of constructions because constructions has one of the principal effects on infrastructure, settling and lifestyle taking into consideration the bearing capacity of the environment and natural resources.

The Institute of macroeconomic analysis and development states in the results of the research in the framework of *The Strategy for the Economic Development of Slovenia* project titled *Slovenia in the European Union: The environment as a development factor* that the basic challenge of the *Strategy for the economic development of Slovenia* [2]. until 2006 is development which increases the welfare of at least the present generations. Therefore Slovenia beside material and well proprietary controlled sources of welfare increasingly incorporates non-material, public and collective sources of welfare in its conventional development policy. But we are well aware of the fact

that the economic rules of use for all the various types of welfare are not the same. But in the rare cases when the rules are the same they are not very successful and not very well put into effect[2].

2 Legal aspects of managing with environment

The primary starting point of the Environmental Management System for organizations is the passed and renovated Protection of the Environment law (OJ RS No 41/2004), which is also the key direction for the formation of the environmental policy in Slovenia. In connection with the environmental legislation EU membership poses a great challenge and obligation for Slovenia, as it provides the right to co-determination and co-formulation of European environmental policies. As a member of the European integration process, Slovenia aspires to achieve a high level of environmental protection with regard to the principles of environment protection and preservation. Slovenia's priority tasks in this sphere also include the development of new legislation and consistent implementation of the current legislation, the encouragement of sustainable use of natural resources, the integration of environmental contents into sector policies, the development of new environmental technologies, the promotion of sustainable production and consumption, the proliferation of "green funds", the heightening of the awareness and strengthening of the dialogue with all stakeholders, as well as cooperation with the public sphere in the decision-making processes [1]. Evidence that legal aspects of environmental protection are becoming an important business factor is also the course Environmental law for postgraduate students of the Institute of public administration on the Faculty of law Ljubljana.

The contents of the course are:

- Part I: (Ethical) origin of current environmental law
- Part II: Current environmental law
- Part III: Fields of environmental law
- Part IV: Environmental law regarding sources of Pollution. [3].

The Ministry of the Environment and Spatial Planning of the Republic of Slovenia on its website (<http://www.gov.si/mop/>) enables the accessibility of environmental laws and regulations on the basis of The Environment Protection Act. There are also given international agreements and regulations on spatial

planning. The extensiveness and diversity indicate the importance of Environmental Management in current operations of companies. It also displays the need for a multi and inter-expert approach, which should not be coincidental. Therefore this approach is becoming an important task of the highest management of a company. Apart from the implementation of legal frameworks companies demonstrate their environmental orientation also with other methods, e.g. with environmental declarations, eco label, EMAS (Eco-management and audit scheme) and with the imparted certificate Systems of Environmental Management ISO 14001:2004 [11]. It has to be taken into consideration that the decision for the extent of Environmental Management is left to the management of a company. Giving effect to requirements and elements of the certificates only indicates the ability of a company to put into effect enterprise novelties but it doesn't give a realistic picture about actual environmental effects and the actual Environmental Management.

3 Environmental management in Construction

Construction Waste Management is a part of a growing movement toward a sustainable world. Sustainability or "green" management techniques are designed to protect the environment, save resources, and conserve energy. The use of construction waste management techniques which rely on salvage, recycle and reuse of materials have proven to have economic benefits for the construction industry. Economic development coupled with ecological health was first termed 'sustainability' in the late 1970s. The terms 'sustainability' and 'sustainable development' were used by the United Nations' World Commission on Environment and Development in its report "Our Common Future" in 1987. Since that time, the ideas have worked down from a world-wide platform to practical applications in the local economy. The state of Washington declared its policy to promote construction waste management planning in design and building through changes in the Revised Codes of Washington in June of 2002. [13].

Legal matters including Environmental Management are the basis for managing a company. Companies are very diverse – in matters of objectives and activities and also in matters of order and resources being used. This diversity makes it difficult to examine, generalize and establish patterns [4]. When managing and planning the objectives of a company irrespective of its type and activity it is important to consider the

normative frameworks. Therefore the management of a company - as the activity of its managers, who plan, organize, direct and supervise the activities of the organization - has to give consideration to the managing and handling of the environment and to the objectives connected with them. So it is inevitable to set objectives and achievement indicators. In evaluating the development of a certain phenomenon it is of crucial importance to be aware of an envisaged trend and intensity of the development. Therefore each indicator is accompanied by a goal.

Each company [8] should set its own measurable and attainable objectives in accordance with and appropriate for its activities. It is also necessary to define the period and time frame of the reporting. The report should include environmental indicators and be reasonably prepared in accordance with Article 106 and 107 of the Environment Protection Act (OJ RS No 41/2004) [7]. In construction is several type of construction waste. And it is important to find typically indicators. Figure 1 presents type of construction waste.

- Vinyl and metals are generated in small quantities, but have good recycling value.
- Cardboard waste is increasing on most jobsites as more components, such as windows, appliances, cabinets and siding, are shipped to builders over long distances.
- Most wood waste is "clean" -- unpainted, untreated and recyclable. This usually includes dimensional lumber, plywood, OSB and particle board without laminates.
- Brick, block and asphalt shingle waste are insignificant in volume, but can be important in terms of weight.
- For most builders, the largest share of waste that could be considered hazardous is generated from painting, sealing, staining and caulking.
- Drive-by contamination (waste placed in a container by a party other than the builder or subcontractor) can be as much as 30 percent of the total volume hauled from a site [12].

Construction Waste

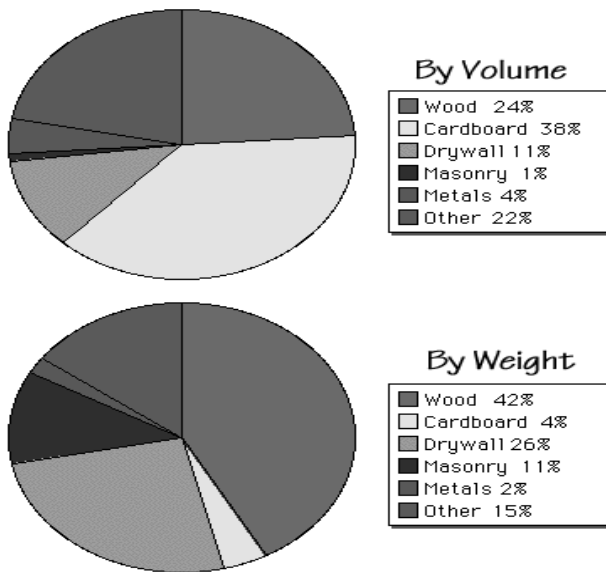


Figure 1: Type of construction waste [12].

Here are some important generalizations about residential construction waste.

- By weight or volume, wood, drywall and cardboard make up between 60 and 80 percent of jobsite waste.

As constructions is an activity which to a high degree includes mainly a part of the data from the Article 107 of the Environment Protection Act (OJ RS No 41/2004) and also the assessment frameworks used by the European Environmental Agency it is reasonable to determine the environmental indicators in accordance with the legislation of the Republic of Slovenia and with European guidelines. The "Environmental Indicators" report for a specific area is prepared and published at least every 4 years by the Ministry of the Environment of the Republic of Slovenia as well as by the community, the commune, or other bigger autonomous local community with a reasonable use of the Article 107 of this law. The content of the "Environmental Indicators" report originates from this law. It is prepared by the Ministry of the Environment and spatial planning and includes data particularly about:

1. natural phenomena, state of the environment, environmental pollution,
2. biodiversity and natural values,
3. endangered, protected and secured areas according to this law and the regulations of the protection and use of natural sources,
4. long-term trends and changes of the environment,

5. the evaluations of the state of the environment and its parts and the endangerment of them,
6. the influence of individual sectors on the state of the environment, especially of agriculture, fishery, forestry, energetic, traffic, industry, tourism and the use of natural sources; including the evaluation of the implementation of the protection of the environment demands into development policies of individual sectors,
7. influences of environmental pollution on the health of the population,
8. the implementation of the Protection of the Environment National Programme and operative programmes,
9. the implementation of programmes and provisions for the improvement of the quality of degraded environments,
10. the sources and spending of means intended for the implementation of environmental policies,
11. implementation of public services for protection and conservation of the environment and water treatment,
12. education, informing and collaboration of the public in the field of environmental protection,
13. important international events connected with environmental protection and
14. other data significant for environmental

From these statements arise the role and the importance of Environmental Management and Waste Management as waste being one of the by-products of constructions. There needs to be a change in the Waste Management approach philosophy – from managing to economizing waste[6]. This approach means a change in the philosophy of the management of a company, which proves that environmental policy is a part of business policy. So the elements of Environmental Management are included in all elements of business processes, activities and products of this company as in planning, producing and the life cycle of individual products. For this purpose there are various tools and regulations in the organisational and technical-technological field and in the field of controlling human resources and the treatment in line with employee's abilities. The consequences of this (tools and regulations) are economy effects which develop into Sustainable Development effects[5]. Especially in the case of environmental protection and Environmental Management it is important that we are very cooperative, creative and aim-oriented.⁹

protection.

In the application for the Licence for Construction Waste Disposal among the conditions from the Waste Management regulations it also has to be evident:

- types and quantities of construction waste for which recycling is being assured,
- the expected way of using the building material, gained from recycling of construction waste,
- the reason for the disposal of construction waste, if it is disposed directly, without processing,
- the way and place of the disposal of the remains of construction waste,
- directions of the environmental protection operative programme in the field of management of construction waste in connection with expected ways and quantities of processing.

Rules amending the Rules on the management of construction waste (OJ RS No, 3/03) 50/04) [9], [10] add the article 13a with obligations of the investor who intends to gain an applicable licence, which states that as a constituent part of the accomplished work project he should enclose a Construction Waste Management Plan to the competent administration agency.

4 Strategies for recycling building materials

Recycling and reuse of materials have long been associated with wise construction practices. Experienced contractors are now reaping the economic advantages of Construction Waste Management. Communities are also seeing the side benefits as listed below.

A. Trim Costs.

Recycling, reusing, and salvaging construction waste can save money. Many of the contractors that have embraced Construction Waste Management have made changes to their operations and practices to take advantage of reduced waste disposal costs and revenues derived from recycle, reuse and salvage materials. Utilizing reuse and salvage methods on site reduce the need for new materials, reduces materials that end up in the landfill, creates a cleaner and safer project site, and improves community relations.

B. Establish a Market Advantage.

A company's experience in waste prevention and recycling is a valuable marketing tool for bidding on

projects in response to customer interest in Construction Waste Management. Efforts to prevent waste, to recycle, and to use recycled-content materials on a project can help the project team earn points towards qualifying for LEED and other local and national programs.

C. Create Environmental Benefits.

Environmental benefits also result from recycling and waste prevention programs. In the long run, preventing waste reduces dependence on natural resources such as trees, oil, and minerals plus creates less pollution by reducing manufacturing and transportation related emissions. Reduction of the energy and water required to produce building supplies from virgin materials contributes to reduced greenhouse gasses related to the manufacturing and transportation of those materials.

D. Help the Economy.

Recycling and reuse of construction waste can also help the economy through the creation of jobs related to salvaging and recycling of construction waste. New products create jobs through the manufacture of recycled content materials.

E. Assist Charitable Organization

Organizations such as Habitat for Humanity can use surplus building materials. Pick-up of materials at the project site can sometimes be arranged [14].

Strategies for recycling building materials:

- Set a goal
- Select a contractor with proven recycling experience
- Use a Construction Waste Management Specification
- Monitor the waste reduction program [13]

Conclusions

The role of the manager of construction systems is to direct to and guarantee reduced pollution and also to prevent the negative effects of the environmental pollution. An important part of the cycle of reclaiming materials is the reuse of those materials. Buying recycled-content building materials supports efficient use of our natural resources without compromising building standards A well developed Construction Waste Management Plan combines good

communication with attention to details. Effective implementation will foster employee pride and elevate the corporate image. This will ensure success, maximize the benefits, and provide a marketing edge [14]. The conviction of the importance of creative cooperation and positive motivation for sound treatment with the environment classifies constructions organisations as environmentally friendly organisations with the aim of a safer and more qualitative life.

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