

# APPROACHES ON THE GREEN INDUSTRY MANAGEMENT STRATEGY IN THE CONTEXT OF SUSTAINABILITY

Oriana-Helena NEGULESCU<sup>1</sup>

**Abstract:** *The concept of green industry is a generic one, because one can find it in any industry or in any field of economic and social activity whose organizations operate under the principle of "environmentally friendly". The purpose of this paper is to highlight the main approaches in green industry organization management, green organizations respectively, regarding: management strategies, strategies assessment and the importance of risk assessment. Finally, a conceptual graphical model for the management system of the organization in the green industry is proposed.*

**Keywords:** sustainability, green industry, green organization, management strategy, environmental risk

**JEL Classification:** G32, O13, Q54, Q56.

## 1. Introduction

Sustainability is defined as the practice of maintaining productivity processes (natural and human) by replacing the resources used with equal or higher-value resources without degrading or endangering the natural systems (Hendrix, 2014). The concept of sustainable development was launched by the Brundtland Commission (1987) and defined as the development that "meets the present needs without compromising the ability of future generations to meet their needs". The concept reflects a fair development without differences between countries or people, harmoniously integrating its three components: economic, social and ecological (environmental).

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<sup>1</sup> Spiru Haret University, Faculty of Legal, Economic and Administrative Sciences of Brasov, email: bellatrix360@yahoo.fr

The new concept launched (Rio + 20 Summit) includes as factors supporting the sustainable development: the green industry, innovation and cooperation (Clark, 2012).

The literature and the development strategies focus more and more on these concepts:

- green economy and structural changes in the eco-socio-economics (Brown et al., 2000; Brown, 2001);
- sustainable enterprise or "green" enterprise and green technologies (Détrie, 2005; Aras & Crowther, 2009);
- Sustainable development management and green management (McDonaugh & Prothero, 1997; Petrescu, 2009).

An official definition considers the green industry as the "way to protect the communities, the vital ecosystems and the global climate from escalating environmental risks and increasing shortage of natural resources" (UNIDO, 2011a).

The green industry can be considered as a process which transforms the resources into results, amid the sustainability desideratum and which conducts "environmentally friendly" activities (Negulescu, 2015, p.11).

## ***2. Green management strategies***

Management strategies in the green industry are not much different from general strategies, but they have a well defined purpose, namely, the contribution to greening the environment.

The strategies by which this desideratum is realized are defined by UNIDO (2011b), of which:

- Sustainable production and consumption strategies;
- Strategies regarding the integration of education, health, safety of people and science into productive activities;
- Cooperation and investment strategies;
- Forecasting strategies of infrastructure eco-efficiency (water, industrial water, energy, recycles materials and waste recovery, etc.);
- Using eco-labelling and certification strategies;
- Greening lifecycle and supply chain production strategies;
- Strategies to accelerate the diffusion of green technology in the world;

- Strategies for increasing the organizations and people responsibility towards the environment;
- Strategies for financing through green credits, loans, grants etc.;
- Strategies to promote environmental management system and to use environmental standards;
- Strategies for monitoring and reporting carbon emissions and other environmental indicators;
- Strategies of integrating environmental policies with corporate social responsibility, including volunteering.

In Europe, the OECD strategies for green development launched in 2011 suggest a flexible policy to suit different levels and circumstances of developing countries, including the implementation strategy of green vehicles (Beltramello, 2012). The report highlights the need to move on to a green transport system and presents market research policies for developing alternatives to the traditional fuel vehicles technologies.

Among the management strategies, those relating to the life cycle and green logistics chain are current concerns. They are focused on green resources and highlight the following types: (Simpson, 2008):

- *Risk-based strategies*: they consist in minimizing the risk regarding the inter-organizational investment in resources development for the organizations that have recently introduced the program for greening the supply chain or retain minimum internal resources.
- *Strategies based on efficiency*: they are based on eco-efficiency or 'lean-and-green' approach. This type of strategy derives from the benefit obtained out of the environment performance for supply chain before asking the suppliers to meet the operations efficiency targets. More performance expressed in benefit arises from the production practices.
- *Strategies based on innovation*: this is a distinctive strategy from the efficiency approach because the obtained performance is much more specific to the environment. Once the supply chain considers processes, technologies or the performance standards complex specifically for suppliers the knowledge level exchanged or the relational investments begin to change.
- *Closed loop strategies*: they are the reverse logistics strategies, including recovering materials in order to reuse them (the high value) or recycling (the low value). These materials may occur

during production as returned goods, or at the end of the lifetime. This type of strategies integrates the environment performance per whole chain of logistics.

### ***3. The environment management system strategy***

The 1996 emergence of ISO 14001 has made possible the new approach to environmental issues, based on EMS implementation and their certification by accredited organizations.

The environment management system (EMS) as defined by ISO 14001 is part of the general management system which includes the organizational structure, the planning activities, the practices, the responsibilities and resources for developing, implementing, achieving, analyzing and maintaining the environment policies.

From a legal standpoint, ISO 14001 aligns perfectly with the existing EU legislation on environmental issues. However, his main aim is more than theory-level compliance, targeting particularly the achievement and the practical demonstration of the organization of high environmental performance through continuous monitoring of the consequences of their own processes, services and products on the environment.

Introducing EMS is related to the increasing complexity of the problems related to pollution, requiring a different approach of the environmental protection; according to ISO 14001, EMS implementation has become an integral part of the company's business strategy.

Many Romanian organizations have been promoting this new approach to environmental issues. Implementation of EMS is facilitated by the creation of the national legal and organizational framework on environment, after 1990, when the first Ministry of Environment was established and a number of obligations for Romanian companies were settled, concerning the creation, within existing organizations, of structures for the surveillance, control, and information on pollution and environmental factors (Ștefănescu, 2014).

In 1997 ASRO adopted the ISO 14000 family of standards (ISO 14001 and EN ISO 14004).

Currently, the economic organizations in Romania pay greater attention to the EMS implementation by the ISO 14001 model and to their certification. Creating EMS provides a systemic approach to the environment requirements by integrating them in the company's business

strategy. The advantages arising from this process must be judged not only economically, but also having in view the risks of an inappropriate approach to environmental issues: it provides control and reduces the impact of organizations activities on the environment.

An environment management system has as main objective to help a company with:

- ✓ identifying and controlling the environmental aspects, the impacts and the relevant risks within the organization;
- ✓ meeting the objectives and targets' environmental policy, including in accordance with environmental legislation;
- ✓ defining a set of basic principles in order to guide future activities targeting the environmental responsibilities;
- ✓ establishing some increases in the company's environmental performance, based on a cost-benefit balance;
- ✓ determining the resources necessary to achieve goals;
- ✓ defining the responsibilities, the authority and the procedures to ensure the involvement of each employee of the company in order to reduce the negative environmental impacts;
- ✓ implementing an efficient system of communication within the company and ensuring the staff training.

The components of the Environmental Management System (EMS) contained in the standard 14001: 2004, adopted in Romania under ISO 14001 since 2005, are summarized in Figure 1.

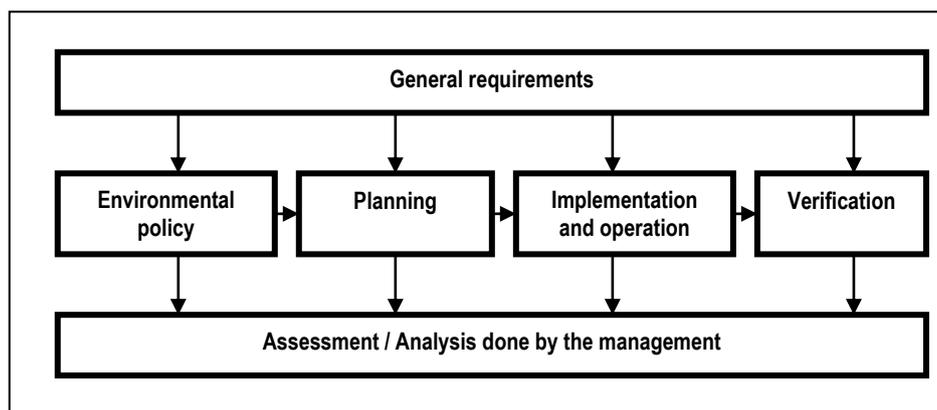


Figure 1. The components of the Environmental Standard ISO 14001:2004 (Negulescu, 2015)

Both quality management, according to the standard ISO 9001, and environmental management, according to the standard ISO 14001, are structured on the continuous improvement concept which is based on the PDCA cycle (*plan, do, check, act*) of Deming (Popescu & Paleriu, 2001). According to the standard ISO 14001, the concept of *continuous improvement* consists of a process of developing an environmental management system in order to improve global environmental performance, in line with the stated environmental policy of an organization. This concept is based on a cause - effect relationship, whose logic includes:

- a system that works on the basis of some objectives and targets to be achieved, for which determinations and evaluations of results are performed;
- if these results are lower than the suggested ones, the causes that led to the failure of objectives need to be identified and analyzed;
- once the causes are identified, corrective actions are suggested in order to eliminate them and prevent their recurrence;
- Based on the experience with the analysis of the causes that led to failures, preventive actions are established in order to overcome the occurrence of similar events. This last stage is the element that closes a cycle of improvement and ensures the transition to another cycle at a level higher than the previous performance.

The environmental management strategy, according to the standard ISO 14001:2004 (p.14), states that the organizational management at the highest level should analyse the management system at planned intervals in order to ensure its continuing suitability, adequacy and effectiveness.

However, the management analysis should include the opportunities for improvement and the need for change in the environmental management system, including the environment policy and the environmental objectives and targets.

#### ***4. Approaches on green industry strategies assessment***

The literature provides a number of methods for strategies assessment in the green industry, mostly focused on the entire life cycle or on the production or services logistics chain. Among the methods used in different studies the following examples might be presented:

- *The multi-criteria analysis for the green suppliers' assessment* (Falatoonitoosi et al., 2014). The model introduces the main factors from the supply - logistics chain as environmental attributes offering an evaluation framework for selecting the most eligible green suppliers. The criteria of importance and influence on the two components are examined: green logistics and environmental protection and 10 factors are identified, and then the dependency relationships between factors are examined. Finally the relationship map is sketched and the influencing factor which may cause the improvement of the green supply chain is determined.
- *The simulation for the green production assessment* (Zhou et al., 2012). The green production strategies selection and assessment are affected by the dynamic conditions and by uncertainty. The simulations are used to capture the real flow of production and the decisions logic and to illustrate the optimum solutions based on simulations replication as well.
- *The fuzzy sets in the management strategy assessment and selection for the logistics chain in the green industry* (Odeyale et al., 2014). The authors used the multi-criteria decision analysis in the study, considering five criteria to assess four strategies in the cement industry. Top management and experts have the opportunity to consider what type of green management to apply and to evaluate the importance of each activity objectively by paired comparisons, to prioritize criteria and finally to express them in fuzzy numbers on a triangular function. The method is implemented on two levels: first there are the fuzzy weights decision criteria and then there are the strategies weights for each decision criterion, obtaining the fuzzy scores.
- *The multilevel auto-regulatory agents' method* (Gagliardi et al., 2014). The possibilities offered by the agent-based modelling techniques in assessing the impact of a set of innovation policies alternatives on the environmental system in which it is implemented are explored.
- *The sustainable innovation cube* (Hanzen et al., 2009). This model is structured to generically present the innovations in sustainability effects in order to decide how to minimize the risk of the

environment-oriented innovations. The model includes three dimensions: the target, the lifecycle and the type of innovation.

- *The dashboard for performance and management strategy assessment* (Hsu & Liu, 2010). The structure of the dashboard is used in the automotive industry in order to understand the relationships between the internal and external, financial and non-financial factors, the results and the driving factors in the environment proactive strategies. These relationships are valorised in order to design a map of the environment strategy and to assess the feasibility of the strategy in terms of performance.

### **5. The risk in the green industry**

Under the pressure of major changes imposed by the economic globalization, the business world has become a space of volatility (Dragomir, 2013). Compared to the general risks faced by organizations, the risks identified in the green industry are mostly caused by the management of the organizations taking wrong decisions in regard to protection and restoration of the natural environment.

The assessment of environmental risk represents for the managers the mission to understand the potential effects of the stressors mentioned and to manage risks in order to safeguard the natural environment health and the resources on which life on earth depends and it is the process of analyzing the environment impact caused by exposure to one or more stressors.

While the risk problems may be planned using conventional methods, the future design can be based on alternative options rather than predictions when the environment becomes uncertain (Doval, 2010).

Most methods for assessing environment risk are based on scoring and on the comparison with the average of the variables considered. Depending on the analysis directions, each method has applicability in a certain geographical area or country (Negulescu, 2015, p.194).

### **6. The management system in the green organization**

Considering the main management approaches and challenges of a green organization, i.e. the strategy development, the risk management, the procedures development and finally the plans and programs development, a model called "the Management System in the Green Organization" results (Figure 2).

This system includes:

- Identifying the processes and the operations that may represent potential environmental problems;
- Assessing the environment management procedures for solving the identified problems;
- Identifying the potentially sensitive environment receptors;
- Identifying the possible pathways of contamination;
- Assessing the risk involved in various activities;
- Ranking its actions of reduction and management, by priorities.

The steps of this system are not delimited.

The *process of strategies development*, as part of the Management System in the Green Organization model, derives from the organization's general strategy. However, this process is supported by the environment risk management which is a continuous process and it is influenced by the stressors and the receptors identified in the external environment.

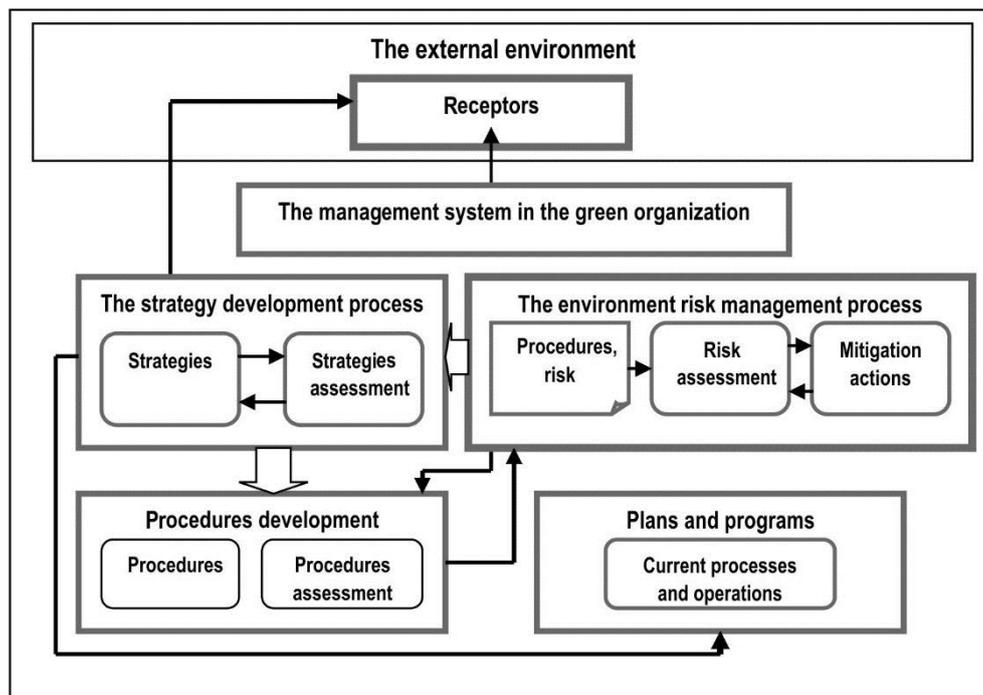


Figure 2. The management system in the green organization

Moreover, this process is also supported by the procedures development of implementing the strategy and the risk management. Plans and programs with deadlines and responsibilities are developed for the practical application of strategies.

## **7. Conclusions**

The concept of sustainable development reflects a fair development, without differences between states or people, harmoniously integrating its three components: economic, social and ecologic (environmental). The new concept (RIO+20) includes as supporting factors of the sustainable development: the green industry, innovation, and cooperation.

The green industry involves two strategies in order to create a system that does not require the eternal increase of natural resources consumption and the pollution as a source of development and expansion of the organizations, namely: greening the existing industries and creating new green industries.

Literature provides a number of methods for assessing the strategies in the green industry, most of which being focused on the entire life cycle or on the logistics chain of production or services which are continuously developed and represent instruments used in the management process.

In the management strategy, simplifying reality is needed so as the basic features of the analyzed socio-economic phenomenon are preserved by building a simple enough but comprehensive model in order to be useful in solving them and facilitate the decision making process.

The proposed model, called "The management system in the green organization" can be a useful tool for the managers in any kind of organization.

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