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Book1

ENVIRONMENTAL MANAGEMENT & AUDIT 1

EU - Tempus Project RECOAUD

# SCARCITY & INTRODUCTION TO ENVIRONMENTAL MANAGEMENT

Borut Jereb, Darja Kukovič & Daria Meyr (eds.)



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*Edited by Borut Jereb, Darja Kukovič & Daria Meyr*



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Retraining Courses for the Sensibilization for and Integration of Eco-Audit Programs in  
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# SCARCITY

Climate is changing rapidly, causing an increasing impact on the environment, especially on humans, because it is difficult for them to quickly adapt. But there are ways in which we can slow down the pace of change and mitigate it - climate change mitigation is all about reducing or preventing emission of greenhouse gases and therefore moving towards low carbon societies. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. In the chapter on mitigation of climate change, we will focus on clean transport and clean energy.

## **Climate change and ecological scarcity as an urgent reason to think about the environmental policy**

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### **1 Introduction**

Resource dependence theory (RDT) describes the corporation as an open system, dependent on the external environment – the influence of external factors on organizational behaviour which could be managed (Hillman, Withers & Collins, 2009). Since the industrial revolution, our society is driven by the increasing pace of change in business and technology. Every few decades, we are exposed to new and decisive events that bring challenges and create opportunities: think of a locomotive, electric lighting, car, airplane, television and computer. The most decisive event in the next 20 years may not come from the invention, but from the world around us - it is climate change.

The response of companies to climate change can apart it from the competition and provide it with the successful sale of new products or highlight the dissatisfaction of customers and smaller margins. Today's top management is not exposed to the question of deciding on its survival, but certainly it comes to the survival of their companies: What is the next decisive change and how you should act? Modern companies should certainly face with environmental challenges.

Natural resources – land, fresh water, breathing air, pest control and climate – are also restricted, but are never visible on the balance sheet although they begin to affect the companies. In the worst case, these “free” resources can restrict companies, develop markets, and threaten the planet. However, these effects are not immediate, because we do not know when the lack of given resource will start, when it will become significantly more expensive and when it will run out. Our only help is to observe the indicators. Among the fastest growing and most direct business-related threats to the environment, investors and participants observe different environmental indicators and ask challenging questions about responsible attitude towards the environment. Business leaders who do not meet these participants can expose their companies to scandals, destroyed markets, end of their careers, and millions or billions in losses. Many companies with well-known brands and international operations are finding that their customers and shareholders are becoming sensitive to their business practices. Their customers

and business results give incentives to combat climate change and business innovation and to introduce environmental management into their corporate strategy.

The interdependence between companies and the environment is relevant for an ecology-oriented management, as a part of the corporate governance, in two different ways:

- On one side, environmental goods are productive factors. Without their participation, according to Gutenberg, entrepreneurial performance is not possible. (see Gutenberg, 1983).
- On the other side, companies use environmental services in the form of supply, carrier and control functions of the ecological environment. (see Günther, 1994).

As a part of its supply function, nature provides the economic system with resources that are used as input factors (extraction use of the environment). Companies use the carrier function by releasing the unwanted outputs (conducts), which occur during production and consumption, into the environment (deposition use of the environment). Therefore, conducts represent unwanted joint products, which are not to be associated with the objective of the business venture, but still emerge with the products (see Günther & Wittmann, 1995). They can exist in a solid, liquid, gaseous or energetic form. Eventually, companies use the control function of the environment by making use of the regeneration process of nature (process use of the environment). In conclusion, the interdependence between companies and the environment can be put down in two questions: “What does the environment expect of companies to put up with?” (e.g. climate change, water scarcity) and “What do companies expect the environment to put up with?” (e.g. resource depletion, emissions). These two questions are concretely discussed in the context of climate change under the keywords adaptation (companies adjustments to diversified climate conditions) and mitigation (reduction of greenhouse gas emissions, in order to control the impact on climate change) (see Bundesministerium für Bildung und Forschung, 2007). But how can we consider these interdependences already today in business administration?

This chapter covers the following questions:

- How is ecological scarcity understood?
- By which means does ecological scarcity emerge?
- How are companies motivated to consider ecological scarcity?

## **2 Forms of ecological scarcity**

### ***Interdependences between companies and the environment***

The two questions “What does the environment expect from companies” and “what do companies expect from the environment” display the interdependent relationship between the two sides – the inside out and outside in interlinkage (Linnenluecke, Griffiths & Winn, 2013)

In the following, using the example of climate change, the environment’s effects on companies will be shown. The impact of a business venture on the environment will be explained using the environmental barometer by the Federal Republic of Germany, whereby the impact on climate change will be shown here as well.

#### Impact of the environment on companies

Adaptation Climate scientists assume, that temperatures will rise until the year of 2099 in comparison to the base period 1980-1999 by 1,1 to 6,4°C (cf. IPCC, 2007). The rise of the sea

level, more frequent and more intensive weather extremes and rising temperatures will have far-reaching consequences for society and economy. In Europe, mountainous and coastal regions, wetlands and the Mediterranean region are particularly affected. Current climate models also allow a prediction of the climate change's impacts on specific regions in Germany. They predict temperatures in the north to rise most. In the northeast, decreased precipitation in the summer and wintery rise of precipitation on the northern side of the low mountain range are to be expected. (cf. Umweltbundesamt, 2007). Further examples for possible impacts of climate change on different industries and sectors in Germany can be found in Table 1.

*Table 1: Impacts of climate change*

|                                |   |
|--------------------------------|---|
| Health                         | Heatwaves, storms, floods, avalanches or landslides, causing diseases and injuries as well as areas of expansion of vector-borne diseases (like TBE, Lyme disease)  |
| Agriculture                    | Reduced crop yields, especially in dry areas of east and southwest Germany as well as a reduction in yield security caused by increased climate variability   |
| Forestry                       | increased vulnerability of tree species unsuited for the location most notably in east and southwest Germany as well as the increased danger of wildland fire and an increased burden on forests caused by pests and extreme weather conditions |
| Water Economy                  | Growing risks of flooding (winter/spring) as well as more frequently occurring low water levels (summer), sinking water levels, especially in east Germany  |
| Nature Conversation            | Endangerment of the biodiversity, especially in wetlands and mountain regions   |
| Transport                      | Impairment of air traffic due to changing air flow conditions as well as an impairment of the inland shipping due to more frequently occurring high and low water levels  |
| Tourism                        | Decreasing snow reliability in mountain regions and increasing heat stress in southern destinations, possible improvements of northern sea destinations   |
| Financial Economy              | Greater direct costs in cases of liability for the insurer and the reinsurer  |
| Energy Economy                 | Impairment of power plant's cooling efficiencies due to high and low water levels as well as an impairment of electricity grids caused by ice loads, strong winds and heavy rainfall  |
| City Construction and Planning | Overheating and insufficient aeration in inner cities as well as poorly measured sewage systems   |
| Building technology            | Greater heat stress in internal spaces due to insufficient radiation protection of buildings and higher air temperature   |

*Source: Umweltbundesamt, 2006*

Adaptation strategies, meaning an adaptation to the impacts of climate change, are thus indispensable. Particularly affected are industries and sectors, which strongly depend on climate

conditions, such as agriculture, forestry and water economy. However, High-tech-industries are also affected. Heat waves reduce the staff's performance and heat sensitive productions need to be protected from overheating. The insurance industry has to plan on annually rising burdens due to an increase in events of storm, extreme weather conditions (see additionally Dlugolecki & Lafeld, 2007).

#### Impact of companies on the environment

Environmental status in Germany The impacts of business ventures on the environment in Germany can be displayed using the environmental barometer by the German federal environment agency Umweltbundesamt ([www.umweltbundesamt.de/umweltdaten](http://www.umweltbundesamt.de/umweltdaten)). It is the aim of the environmental barometer, which exists since 1998, and is, at times, also referred to as German environment index DUX (Deutscher Umwelt-Index, in the style of the German share index Deutschen Aktienindex DAX), to give a description of the state of environment in the Federal Republic of Germany and its development. Only few indicators shall make the development of the environmental situation measurable and support its steering. The indicators of the environmental barometer cover the key subjects of environmental policy in Germany and are connected to political objectives. The nine indicators of the environmental barometer stand for the fields climate, air, terrain, water, mobility, biodiversity, agriculture, energy and natural resources. Accordingly, taken for instance the field climate, the companies' impacts on the environment are displayed through CO<sub>2</sub>-emissions from the source groups industry, households, transport, manufacturing and energy economy. For the source group transport, a further subdivision in motorized private transport and freight transport is created. In each case the specific emissions (emissions/transport services) for CO<sub>2</sub>, PM, NO<sub>x</sub>, VOC, SO<sub>2</sub> are separately displayed. The following example shows, how the impacts of one single company on the environment can be displayed.

All passenger cars manufactured by Mobility Unlimited after 2009 have a maximum amount of carbon emissions of 120 g/km. Each year, in comparison to the previous model, 1.260.000 t CO<sub>2</sub> can be saved with the passenger car customers. For comparison: the plant in Dresden emitted 418.506 t CO<sub>2</sub> in the year 2007. The fact, that the company installed a photovoltaic system at its site in Mexico, which supply two thirds of the office space with energy also belongs in this category.

Relevance to decision-making The correlations demonstrated above show the interdependence between the environment and companies. The entrepreneurial relevance comes from the fact, that companies decide on the use of scarce environmental resources on a daily basis. But in what way are these economically scarce and considered in operational decisions?

***When, at a certain place, at a certain time, needs and requirements for a certain good or a certain service exist, but, at the same time, the possibility of their complete fulfillment is not given, it is called an economic scarcity. An unlimited amount of needs is therefore opposing a limited amount of resources.***

In the case of competing possible uses of resources, the one offering the highest satisfaction of needs is to be chosen. Due to rivalries between consumers, regarding a certain good, a price formation on the market is established. Connected with this valuation and payment of good or services is the acquisition of property and thus the rights of disposal. As a result, others may be excluded from the use of the good.

Economic scarcity of the ecological environment Now the question arises, whether or not the ecological environment meets the four criteria scarcity, rivalry, evaluation and exclusion principle. An economic scarcity exists, as long as companies use the ecological environment as a supplier of natural resources or as a medium for the reception of unwanted output and as long as there are market prices for these input and output factors. The same is true, for when the company's utilization of the environment causes costs for another company. An example for this could be water being treated in order to achieve a certain degree of purity for the reuse in production or the need of adjustments mentioned above. In the past, however, many environmental goods, for example water or space for deposit were not viewed as scarce. Because of this, there were no restrictions in use, no rivalries and no costs for the user. The ecological environment was seen as a free, public good(cf. Hardin, 1968). Although the increased stress, partly even overuse, resulting from this, led to parts of the ecological environment being macro-economically scarce (e.g. the atmosphere as carrying medium for greenhouse gases), micro-economically they are mostly viewed as free goods. And even if there are already market prices for environmental goods, it is still questionable, whether the ecological scarcity of resources and the actual stresses to the ecological environment are being considered. Examples for the economic scarcity in the ecological environment regarding our company Mobility Unlimited can be found in Table 2.

Ecological scarcity Regardless of the economic scarcity, the entire ecological environment, meaning the withdrawal of goods from nature (supply function) and the absorption of conducts (reception function) by nature, as well as control function (e.g. pollination), is to be viewed as ecologically scarce. The ecological scarcity is measured by looking at the ratio from actual use of environmental functions with the possible use regarding sustainability. Here we can distinguish between two types of ecological scarcity, the scarcity of rates and the cumulative scarcity (cf. Müller-Wenk, 1978).

Ecological scarcity of rates Scarcity of rates means, that a harm to the overall system occurs, when a critical rate of withdrawal (e.g. use of resources), respectively reception (e.g. air pollution) is exceeded. That means, that certain amounts do not necessarily cause harm to the overall system, but that they are maybe even necessary for human life (an example would be the natural existence of CO<sub>2</sub> in the environment, which is not caused by man) An exceeding – especially for the longer term – can, however, lead to disturbances of the ecological balance. This scarcity of rates is typical for renewable resources. These can be used, in some extent as production factors, without harming the overall system. But if the removal rate is higher than the regeneration, the long-term continuance is at stake.

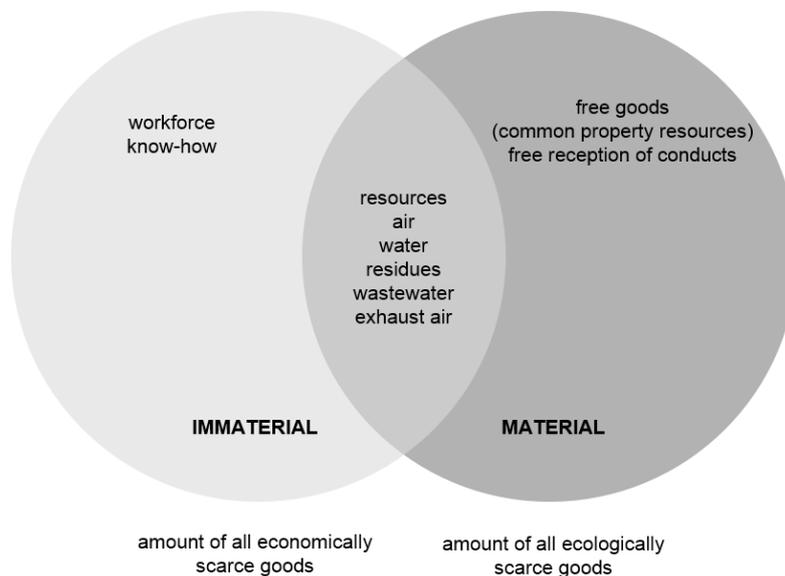
### ***Ecological cumulative scarcity***

An environmental good is cumulatively scarce, when the resource, respectively the reception medium is, after a limited number of uses exhausted (e.g. oilfields or the absorption capacity of a dumping area).

Characteristics of ecological scarcity Ecological scarcity is therefore characterized by a certain utilization limit of a resource, which is to be viewed critically, or the natural stabilization function (capacity, performance limit) (sustainably possible use) as well as the extent of the entirety of all use (actual use). Generally speaking, it is called an ecological scarcity, when the extent of use has already –even in a still tolerable way- approached the limit.

Comparison of economic and ecological scarcity A comparison of the two scarcities shows, that, by all means, a certain overlap of the two does exist, meaning, that the ecological scarcity is already being internalized in business decisions due to the economic scarcity. However, the ecological scarcity of environmental goods and services is more extensive than the economic scarcity, as it includes not yet evaluated or not evaluable component. It does, nevertheless, not include resources with immaterial character, the evaluation of which is being increasingly scientifically discussed, that are also part of the economic scarcity (see for example AK "Immaterielle Werte im Rechnungswesen" der Schmalenbach-Gesellschaft für Betriebswirtschaft e.V., 2005). When economic evaluations of environmental goods and services pretend high reserves, signals of economic scarcities are oftentimes not identified and the use stays at a high level. If the use, which depends on the level of the market price, reaches the proximity of a critical limit, it is called, as shown, a scarcity, when this limit is, for a short time, during a crisis, crossed and an ecological catastrophe, when it is crossed long-term.

*Figure 1: economic versus ecological scarcity*



*Source: based on Günther, 1994*

External effects Every time, economic and ecological scarcities collapse, it can cause an overstrain of natural resources. Consequently, the interests of economic entities and life forms, that are not connected with the process in any way, are affected. Seen in terms of society as a whole, costs of the macro-economic depreciation are therefore higher than costs, that go into micro-economic decisions, due to economic scarcity. So-called external effects arise. External effects arise when resources are used and display interferences, that affect the direct benefit of others. They are not considered in the pricing mechanism. In the course of this, the economic entity affected by the external effect cannot intervene in any way. External effects can emerge from production activities, as well as consumption activities, while influencing the benefit function of other economic entities, consequently damaging the macro-economic efficiency. External effects can occur in a positive or a negative form, whilst the demand of third parties refer to negative effects, that cause material or immaterial disturbances (external costs) (see additionally Pigou, 1932).

**Examples for the manifestation of ecological scarcity and external effects**

For every environmental good, the functions of the ecological environment, that are made use of by said good, can be examined on aspects of the scarcity of rates and cumulative scarcity. In doing so, one can distinguish between already internalized effects (I), meaning that they are priced on the market, and external effects (E). The following table displays examples for Mobility Unlimited.

*Table 2: Internalized (I) and external (E) effects*

|                            | <b>supply function</b>                                | <b>carrying function</b>  | <b>regulation function</b>   |
|----------------------------|---|---|--|
| <b>rate scarcity</b>       | I: renewable resources – cotton                       | I: air emissions with limit values – pesticides   | I: introduction of wastewater with wastewater charges on the basis of preserving self-cleaning                 |
|                            | <b>E: watering of plantations – free use of water</b> | <b>E: air emissions without critical values – dirt/particles</b>                                    | <b>E: introduction of wastewater without wastewater charges – decrease in fishing possibilities</b>            |
| <b>cumulative scarcity</b> | I: fossil energy sources – fuel on a fossil oil basis | I: deposit area for wastes  | I: costs due to a prohibition of introducing wastewater in order to prevent waters from spoilage               |
|                            | <b>E: watering of plantations – free use of water</b> | <b>E: the problem of contamination – pesticides in the soil and waters, respectively ecosystems</b> | <b>E: spoilage of waters due to the introduction of unknown wastewater – decrease in fishing possibilities</b> |

At one of their sites Mobility Unlimited produces passenger cars with seat covers made from a mixture of cotton and polyester. A cotton producer waters his fields with large amounts of water and fights pests on the fields with the help of pesticides. The water of a lake close-by is available free of charge. Therefore, the resource water goes into the company’s calculation with a price of 0. However, the long-term withdrawal of water causes a drop of the water level in the lake. The extensive use of pesticides in the cotton production in large areas causes a decline in water quality. Because of this, the regional fishing industries has to cope with a decrease in fishing possibilities. Due to the occupation of the supply and reception function, macro economically seen costs emerge, that exceed microeconomic calculative costs. The harvesting machines run on diesel fuel.

The table is to be read like this: Companies use the respective function of the supply, reception and regulating function, while the effects are already internalized through costs (I), respectively yet to be externalized (E).

### 3 Reasons for growing ecological scarcity

Approaching limits of use Now the question arises, what the rise of ecological scarcity, meaning the approach of limits of use of the environmental functions, can be lead back to. Generally, there are three substantial causes, the growth of population, the affluence, meaning the equipment with goods of individuals, as well as the technical progress. These can be displayed using the Environmental Impact Index made by Commoner, which, alongside the population growth, the population concentration and the industrialization, presents the “free good character” of the environment as a causal complex (cf. Commoner, 1972).

Figure 2: IPAT equation

$$I = P * A * T$$

I = Impact

P = Population

A = Affluence (the individual's equipment with goods)

T = Technology (harm done by economic goods for technological reasons)

#### **Population growth**

For a start, it is being argued, that there is a direct connection between population growth and the environmental situation, since more people are in need of more resources and therefore the functions of the are demanded more. When in 1650, the doubling time of the world population was at 240 years, in 1965 it was already reduced to 100 years. In 1965 it dropped to 36 years. This development demands an incensement of food production, an increasing amount of energy as well as a rise in industrial production (cf. D. H. Meadows, Randers, & Meadows, 2006).

#### **Affluence**

Assuming that the human needs will never be satisfied and regarding, that economic subjects aim to maximize profit, there is growth in all economic sectors. In agriculture, significant growth may oftentimes only be achieved by increasing intensification (higher use of fertilizers and pesticides), since the area of arable land is limited. In the industry, excess production tends to lead to an increased energy and resource consumption. Additionally, due to increasing population concentration, the environmental media water, earth and air of specific regions are claimed more.

#### **Technical progress**

In the industrialized countries, the continuous technical progress is said to be the reason for ecological problems. Increasingly more resources are used due to the production and consume of highly specialized goods. Because of the advancement of the state of technology, technically still functional goods become obsolete and are being replaced. In the time of, respectively at the end of the consumer phase, however, more conducts in the form of waste, wastewater and waste air come to exist, as well. This development is barely regionally limited, highly complex and mostly irreversible. Limits to Growth Getting in the center of the public discussion are the

impacts of human action on the environment and its limits of use by the study “limits to growth” published in 1972 by Dennis L. Meadows et al. (see additionally D. L. Meadows, Meadows, & Zahn, 1972). The authors analyzed industrialization, population growth, malnutrition, the depletion of non-renewable resources and pollution of the environment as global trends. They reached the conclusion, that, with economic operations not changing, within a hundred years the limits of growth would be reached. But they also presented possibilities for an ecological and economic stability. In 1992 the study “the new limits of growth” was published (see additionally D. L. Meadows, Meadows, & Randers, 1992), which was built upon the study from 1972. The simulations were updated, regarding new insights and developments. The conclusion from 1972 was confirmed and emphasized even more firmly. In 2006, eventually, the “limits to growth – the 30 years update” (see additionally D. H. Meadows et al., 2006). was published. Based on the most recent data and updates of the model, possible developments from 2002 to 2100 are being simulated and displayed in different scenarios. The theses of the former studies were confirmed and the development trends for the next 20 years were shown. In doing so, it was observed, that, in the case of a continuation of current lifestyles and the current development, already in the year 2030 a great environmental disaster is to be expected. Even the strict fulfillment of current environment protection and efficiency standards can only attenuate this trend a little.

#### **4 Homo oeconomicus vs. Homo reciprocans**

##### ***Homo oeconomicus***

So why do we, as economic subjects, barely take this knowledge into account? The economic sciences take the homo oeconomicus as a starting point for their theoretical models and instruments (see additionally Smith, 1999). It behaves on the basis of available information as a rationally deciding economic subject, in order to maximize its individual benefits with given preferences and restrictions. As long as the rationality criterion is based upon a monetary assessment of its benefit, the homo oeconomicus will, for his actions, only consider the ecological environment in terms of its economic scarcity. So why should economic subjects, beyond that, consider the ecological scarcity for their actions? Why do companies establish an ecologically oriented management and incorporate not only economically scarce environmental goods, but also environmental aspects?

##### ***Limited rationality and homo reciprocans***

As an opposite pole to the classical theoretical model, Simon has created the term “bounded rationality” (cf. Simon, 1955). He argues, that decisions do not have to be perfect, but enough (“satisficing”) to ensure survival (“suffice”). That way, the goal of maximizing profit can become a minimum profit as a constraint, that is to be reached. The behavior model of the homo reciprocans delivers a further explanation (cf. Hahn, 2005): The key insight of this concept, developed in the experimental economy, is, that the principal of reciprocity can be a rationality criterion. Reciprocity can appear negatively as an enforcement or positively as a gift. For the ecologically oriented management, a continuum from the enforcement over the exchange and the mutuality to the gift, can explain for a consideration of ecological scarcity: Legal requirements for the companies, from the EU, the federal state, the counties or the communities, oftentimes appear as enforcements, forcing the inclusion of environmental aspects in the decision making. Market economic thoughts, in which environment protection as a competitive function stands in focus, are based on the principals’ exchange and mutuality as

motivation for an ecologically oriented management. A moral-ethical philosophy as a trigger can, however, be understood as a gift from the management to the environment and the affected. Moral and ethical ideas as triggers, however, can be understood as a conscious gift of the management of the environment and stakeholders. From the perspective of the consumer, the theoretical model of the homo reciprocans can also mean, that not only the economic efficiency is to be chosen as a decision criterion, but also, for instance, time efficiency (key word: deceleration) or an eco-centric attitude.

## **5 Integration of environmental awareness and policy on business**

From a macroeconomics point of view, the environmental performance of the countries shows the clear picture on the awareness of people to climate change. To answer on a question “How well countries perform on high-priority environmental issues in two broad policy areas: protection of human health from environmental harm and protection of ecosystems” was developed Environmental Performance Index. It is constructed through the calculation and aggregation of 20 indicators reflecting national-level environmental data. These indicators are combined into nine issue categories, each of which fit under one of two overarching objectives (<http://epi.yale.edu/our-methods>).

The Pilot Trend Environmental Performance Index (Trend EPI) ranks countries on the change in their environmental performance over the last decade. As a complement to the EPI, the Trend EPI shows who is improving and who is declining over time. According to the EPI statistics Russia is on the 73<sup>rd</sup> place out of 178 countries that were evaluated in 2012 year. Then year change is 4,21%. According to the statistics of EPI the population of Russia is 143.53 million of people, the GDP/Capita is 12.700\$ and the territory of the country is 18.826.303 square km. Thereby, the percentage of the change is tragic, as the country has an open access to the drinking water, thousands of the kilometers of wild forests, and financial conditions to keep the environment green and to support sustainability.

# Climate change adaptation

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Since the industrial revolution, our society is driven by the increasing pace of change in business and technology. Every few decades, we are exposed to new and decisive events that bring challenges and create opportunities: think of a locomotive, electric lighting, car, airplane, television and computer. The most decisive event in the next 20 years may not come from an invention, but from the world around us - it is climate change.

## 1 Introduction

The response of a company to climate change can apart it from the competition and provide it with the successful sale of new products or highlight the dissatisfaction of customers and smaller margins. Today's top management is not exposed to the question of deciding on its survival, but certainly it comes to the survival of their companies: What is the next decisive change and how you should act? About how smart companies use environmental strategy to innovate, create value and gain competitive advantage, the authors write the following: "In today's world, any company, large or small, local or global, production or service, cannot afford to neglect environmental challenges. As business leaders we are aware of the limitations of its growth" (Esty, Daniel in Andrew Winston, 2006).

Natural systems are also restricted: Some experts estimate that our planet gives "free" services equivalent to 33 trillion dollars, which includes land, fresh water, breathing air, pest control and climate that allows viability each year. These services are never visible on the balance sheet but are beginning to affect any company. In the worst case, these "free" services (or lack of thereof) can restrict companies, development of markets, and threaten the planet. However, these effects are not immediate, because we do not know when the lack of given resources will become pressing, when it will become significantly more expensive and when it will run out. Our only help is to observe indicators. Among them are the fastest growing and most direct business-related threats to the environment, investors and participants, based on which we should ask ourselves challenging questions about the responsible attitude towards the environment. Business leaders who do not meet these challenges can expose their companies to scandals, destroyed markets, end of their careers, and millions or billions in losses. Many companies with well-known brands and international operations are finding that their customers and shareholders are becoming sensitive to their business practices. Their customers and business results give incentives to combat climate change and business innovation.

***History is full of stories about companies that do not observe the upcoming changes and were not able to adjust to them in proper time or who simply fail at their adaptation. The reasons for this are the following (Knez, 2013a):***

- They don't see the changes

The first reason is that numerous business leaders simply do not see the changes. Many events that are changing markets start as a marginal movement, and few people recognize them or see them in due time. Entrepreneurs may be provided with an opportunity to develop responses for a number of years and repeatedly fail to do so, until the changes or innovations "explode", seemingly overnight. For example, societal trends are firstly shown as a small sample of events in purchases, until one day they grow into a fundamental change in the market. Identification of changes is therefore not easy.

- They fail to respond

Many companies identify critical changes when they occur, but the identification of obstacles on the road is easier than the prevention of traffic accidents.

- They fail to implement

After recognition of the critical changes and planning its response, the company should implement the plan. For business leaders, changes, new ideas, and finding new opportunities for growth, can be difficult, but these are really the only things that will keep them in the position of the business leader.

In *Table 1* you can find just a few ways how to take advantage of company concern for the environment.

Table 1: Few ways you can take advantage of company concern for the environment

|   |
|---|
| <b>Increased profit and market share due to:</b>  |
| <ul style="list-style-type: none"> <li>• Public relations and perceptions in the market,</li> <li>• The possibility of introducing new products,</li> <li>• Achieving separation from competitors,</li> <li>• Increased customer loyalty,</li> <li>• Recruiting the best staff,</li> <li>• Conservation of key employees,</li> <li>• Commitment and conviction employees.</li> </ul>  |
| <b>Reduced costs:</b>   |
| <ul style="list-style-type: none"> <li>• Materials,</li> <li>• Energy/Power,</li> <li>• Water consumption,</li> <li>• Changing products,</li> <li>• Reuse of materials,</li> <li>• Packaging,</li> <li>• Transport,</li> <li>• Disposal,</li> <li>• Waste treatment,</li> <li>• Landscaping.</li> </ul>   |
| <b>Reduced risk:</b>  |
| <ul style="list-style-type: none"> <li>• Market risk - compliance with the law and avoid penalties,</li> <li>• Balance sheet risk - liability insurance losses of property, financing,</li> <li>• Operational risk - due to hazardous materials and changing energy costs,</li> <li>• Capital risk - due to the elimination and control of pollution, investors' support,</li> <li>• Avoiding leakage of shareholders,</li> <li>• Brand protection,</li> <li>• Increased market capitalization,</li> <li>• Reduced weighted average cost of capital.</li> </ul> |

## 2 Far-sighted use of resources

The history of mankind has shown that without easily accessible, available, and cheap energy there is no development. Although fossil energy sources - coal, oil and gas – have replaced wood and the power of people and animals, it is now clear that these resources will not be able to continue powering the development for the next centuries.

The reasons for this are several, but the most important are as follows:

- Fossil fuel supplies are extremely limited, renewed too slowly for our needs, and their use is becoming more expensive. Coal, oil and natural gas are all fossil fuels, formed in few million years by the extinction of plants and animals. They are located in the interior of the earth. Although fossil fuels are also now emerging to the surface due to underground heat and pressure, they are being consumed a lot faster than they are discovered. By the excessive use of this energy there is a risk of running them out. The first warning that fossil fuels are running out is already 30 years old. Predictions about how much fossil fuel we have available vary from day to day. When forecasting the reserves, it is necessary to take into account the fact that in some places fossil fuels are easily accessible, which means that they can be drawn or excavated at low costs.
- Most of the newly discovered stocks are such that are difficult to exploit with today's technology, and getting them represents extremely high costs. For this reason, not all newly discovered deposits of gas, oil or coal are necessarily economically justified.
- Fossil fuels are only available in a handful of countries, meaning that other countries which do not have fossil fuels are energy dependent. This leads to volatile prices, unreliable supplies and even tougher conflicts. Due to the small stock of available oil and gas resources today, all fuel is delivered from a small number of countries that are exporting fossil fuels. The result is a large dependence of the industrialized countries from producing countries, mainly from countries in the Middle East. Centralization of production and distribution of fuels is the main reason for the vulnerability.
- Industrialized and other countries are very vulnerable to changes in inventories of fossil fuels. Vulnerability and dependence influence global policy. Political situations set up oil prices, and every conflict in a region, which is a source of fossil fuels, leads to higher oil prices.
- The world economy is thus dependent on these conflicts. Fossil fuels pollute the environment and are also a primary cause of climate change caused by man, acid rain and air pollution.
- Although today's methods of energy production and consumption bring a better life and development for certain parts of humanity, there are many groups and even nations, to which this is impossible. For this reason, it is necessary to address the impacts of energy not only as an environmental challenge, but also as a social problem.

As has already been mentioned, fossil fuels represent a source of energy that needs millions of years for its creation, which means that they do not regenerate as quickly as we now consume them. This basic deficiency of fossil fuels can be mitigated by the use of renewable energy sources (RES). Their most important feature is that they are sufficient in nature, and that they either never run out or are recovered fairly quickly. Another important feature is that they are distributed evenly, which means that almost every country has some of the available renewable

energy sources. The third feature of RES is that their use pollutes the environment and harms society significantly less than fossil fuels.

In addition to its good properties RES have the following advantages (Knez, 2013b):

- They reduce dependence on imported energy sources and increase energy security. Growing imports of oil, gas and coal increase dependence, both politically and economically. The use of energy resources that are available locally reduces this dependence and thus strengthens the certainty of access to energy sources.
- They promote employment and rural development. RES industry is currently one of the fastest growing sectors. In general, the technology for the utilization of renewable energy sources is more labour-intensive per unit of output as technology use fossil fuels. For example, in Germany the RES sector employs more than 300,000 people. Since the biomass available in the countryside, its use is related to rural development, where the use of biomass generates jobs.
- Improving the quality of the environment and prevent further climate change. Renewable energy sources as opposed to fossil fuels do not emit such large quantities of greenhouse gases. Therefore, the use of RES can help to reduce CO<sub>2</sub> emissions and thereby to facilitate the fulfilment of the objectives of the Kyoto Protocol.
- They attract investments for the reconstruction of obsolete technologies to generate energy. A large part of the existing power plants uses technologies that are outdated and ineffective. Replacing them with more environmentally friendly and more efficient technologies can attract investments, without which it would not be possible to modernize existing plants.
- They are becoming cost-competitive with fossil fuels. It is assumed that the energy from RES in the future will be significantly cheaper than energy from fossil sources, as technologies for utilization of RES are refined and achieve lower prices.
- They are increasing efficiency. Their scatter and accessibility enable the democratization of the energy sector and better coordination of energy types to local needs.

### **3 Renewable energy sources (RES)**

Renewable energy sources (or clean sources) include biomass, solar energy, hydropower, wind energy, geothermal energy and heat pumps. Bellow you can find some types of RES with their description, advantages, and disadvantages.

#### ***BIOMASS***

Biomass represents wood, grasses, energy crops, vegetable oils, etc... Approximately 7-10% of the basic energy needs of the world are satisfied by biomass, which consists mainly of natural wood: wood from the forest (logs, branches, bushes, etc.); wood waste from industry (waste pieces, sawdust, bark and wood waste products such as crates, pallets, etc.). The biomass in the first place is used to obtain heat, which can then be used for heating or for electricity generation.

#### ***SOLAR ENERGY***

Solar energy is an inexhaustible source of energy that can be exploited in three ways:

- passive - with solar systems for heating and lighting of premises
- active - with solar panels for hot water and space heating,
- photovoltaic - solar panels to produce electricity.

**HYDROPOWER**

Water is the most important renewable energy source and that 21.6% of all electricity in the world is produced by harnessing the energy of water and hydropower.

**WIND ENERGY**

Wind power can be converted into electrical energy. Theoretically, the electricity can be converted to a maximum of 60% of the wind energy, in practice, however, only 20 to 30% with wind power ranging from a few kW to several MW. Plants with higher power produce more electricity. With the development of technologies that power tends to increase.

**GEOHERMAL ENERGY**

Geothermal energy is the heat that is generated and stored in the interior of the Earth. It can be exploited directly through the capture of hot water or steam wells or by cooling the hot rocks. The temperature of the thermal water makes the possibility of using geothermal energy.

*Table 2: Pros and cons of RES*

| RES                 | Advantages  | Disadvantages   |
|---------------------|---|---|
| <b>BIOMASS</b>      | <ul style="list-style-type: none"> <li>- is a renewable energy resource</li> <li>- contributes to forest clearing</li> <li>- reduces emissions of CO<sub>2</sub> and SO<sub>2</sub></li> <li>- reduces dependence on imports of energy</li> <li>- provides rural development</li> <li>- creation of new jobs</li> </ul>                           | <ul style="list-style-type: none"> <li>- high cost of technologies for use of biomass</li> </ul>  |
| <b>SOLAR ENERGY</b> | <ul style="list-style-type: none"> <li>- electricity production from photovoltaic systems is environmentally friendly</li> <li>- use of solar energy does not pollute the environment</li> <li>- production and consumption are in the same place</li> <li>- photovoltaics can supply remote areas and remote devices with electricity</li> </ul> | <ul style="list-style-type: none"> <li>- difficulties in using the solar energy due to different sunshine radiation levels of individual sites</li> <li>- the price of electricity generated from solar energy is much more expensive than those produced from traditional sources</li> </ul> |

|                   |  |  |
|-------------------|--|--|
| HYDROPOWER        | <ul style="list-style-type: none"> <li>- non-polluting,</li> <li>- has a long lifetime</li> <li>- relatively low operating costs.</li> </ul> | <ul style="list-style-type: none"> <li>- building represents a major intervention in the environment</li> <li>- fluctuations in production depending on the availability of water in different months of the year and great investment value</li> </ul>  |
| WIND ENERGY       | <ul style="list-style-type: none"> <li>- simple technology</li> <li>- electricity production does not cause emissions</li> </ul>             | <ul style="list-style-type: none"> <li>- the visual impact on the environment due to their size</li> <li>- in close proximity, wind power plants cause a certain level of noise</li> </ul>   |
| GEOTHERMAL ENERGY | <ul style="list-style-type: none"> <li>- overall effect is positive</li> </ul>   | <ul style="list-style-type: none"> <li>- settling of the soil, resulting from the emptying of aquifers (prevented by reinjection)</li> <li>- thermal pollution of surface waters in which discarded geothermal water is deposited</li> <li>- the deposits of the thermal waters in a river or lake increases the amount of harmful substances (carbonates, silicates, sulphate, chlorides, Hg, Pb, Zn, etc..), solids (sand, silt) and salinity</li> <li>- in the piping system, resulting sediments include some solutes but also cause corrosion of pipes</li> <li>- the production of electricity may cause air pollution, because the geothermal steam also contains gases (CO<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, CH<sub>4</sub>, N<sub>2</sub>, H<sub>2</sub>), where H<sub>2</sub>S represents the greatest problem, because it oxidizes to sulphur dioxide which in turn makes sulphuric acid and causes acid rain</li> <li>- steam from geothermal location also causes noise (the free release of steam has a sound output up to 120 dB, therefore it is necessary to install silencers)</li> </ul> |

#### **4 Examples of clean production: cases on clean transport and energy**

Climate is changing rapidly, causing an increasing impact on the environment, especially on humans, because it is difficult for them to quickly adapt. But there are ways in which we can slow down the pace of change and mitigate it - climate change mitigation is all about reducing or preventing emission of greenhouse gases and therefore moving towards low carbon societies. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. In the chapter on mitigation of climate change, we will focus on clean transport and clean energy.

In order to reduce CO<sub>2</sub> emissions from transport numerous technical measures (such as introduction of engines with lower emissions) have been adopted. Nevertheless, the amount of CO<sub>2</sub> emissions in 2007 exceeded the amount of emissions in 1990, as the number of cars and trucks and annual mileage dramatically increased worldwide. Options to mitigate global climate change include a shift from truck, car and air transport to electric railways and the introduction of e-vehicles that use green electricity. Given the current energy sources in Europe (2010: natural gas 23.2%, oil 2.2%, coal 27.6%, 28.0% nuclear, 19% renewable energy), CO<sub>2</sub> emissions can be reduced up to 40% if the vehicles with internal combustion engines were replaced by electric vehicles. If we would acquire electricity from green energy, emissions can be reduced by more than 80%, depending on the type of energy: wind, solar or water. However, due to the specific climate conditions and energy production, these conditions cannot be transferred directly to Russia. In the regions of Omsk, Samara, Sverdlovsk and Tyumen, the use of hybrid vehicles would be necessary, since high energy consumption on long-distance transport and in wintertime reduces the number of kilometres of electric vehicles. One of the options is also vehicles on biofuel, if biofuel production takes place in the same region and strict ecological requirements are taken into account.

Nowadays, efficient diesel, hybrid and electric vehicles have almost the same capacity. If a larger proportion of electricity will be produced from renewable energy sources in the future, CO<sub>2</sub> emissions produced by electric vehicles during their operation will be negligible.

In the media the opportunities for greening the transport system by using alternative propulsion systems are often presented as something that is tied exclusively to cars. However, many pioneers demonstrated that already for almost all transport sectors there are available vehicles using environmentally friendly technologies and alternative propulsion systems that can be adapted to almost any requirements. Above all, in tourism, in the fleets of eco-friendly businesses and in local government the use of "green" vehicles will be much appreciated. This will create additional benefits for individual stakeholders. Nevertheless, certain areas of transport – such as heavy goods vehicles on the market – are not strongly represented. Thus, it may remain for a further two or three years. In other areas of transport, for example in the field of electric two-wheelers (electric bicycles, electric scooters etc.) there are economically and technically competitive solutions already available, and in addition, the offer is increasing very rapidly. In these types of vehicles there are therefore still just a few technical challenges.

Fleets are ideal for innovative propulsion technologies, such as electric cars and electric vans. The purpose of the trip is usually well known, so it is easier to assess if the vehicle is appropriate and meets the requirements.

Field of urban logistics is particularly interesting in terms of reducing the environmental impact associated with transport in cities. First, the replacement of individual deliveries to the final customer or vendor supplied by only partially loaded trucks with optimized tours with smaller city logistics vans - with a higher loading factor - helps prevent unnecessary noise and emissions in vibrant urban centres. Secondly, the "green" technology vehicles (ideally with electric propulsion systems) help to reduce the impact of delivery of goods to the environment.

While in the distant future electric mobility is likely to prevail, we must now rely on intelligent mix of drive systems. In cities and for short distances electric bicycles, electric scooters and electric cars are the most efficient, in terms of energy. For long distances, we should use train or vehicles with low emissions – with the use of biofuels where possible. In the agricultural sector many machines can run on pure vegetable oil.

We must realize that economic development is closely, even symbiotically linked to the efficiency of the transport system, so societies must provide for the consistency of its operation. In other words, it is necessary to ensure sustainable development of traffic flows of freight, as well as of people, and, to adapt these flows comprehensively enough to the needs of a modern economy. Thereby the wishes of people should not be ignored, who subordinate their selection of modes and directions of transport to their own needs or ways of their lives. The modern practice shows that people combine modes of transportation due to the optimization of logistics, i.e. shorter transportation time, cost reduction, utilization of space availability, environmental effects, etc.,. Therefore, today, passengers and cargo are transferring from one transport system to another one.

In addition, we must be aware and learn to foresee the effects (especially negative) of the transport system. Continued traffic growth and the related increased needs, which are due to the increased population mobility on the one hand and to the all-encompassing rationalisation of organizational and business systems operations on the other hand, require comprehensive transport management. This is especially necessary because of disproportionate or non-sustainable development of certain transportation subsystems and their impacts on the deterioration of the desired quality of life (Rosi and Sternad, 2007, 33).

As far as encouraging the use of clean energy, the Alpine region of the EU can be set as a good practice. All Alpine countries and regions implement strategies to reduce pollution and greenhouse gas emissions. However, programs of regional development in each of the Alpine countries may differ significantly. Bavaria has in 2030 set itself a goal to reduce CO<sub>2</sub> emissions to less than five tonnes per capita per year. Other regions, such as South Tyrol, have also set ambitious (2020: <4 tonnes per capita / year; 2050: <1.5 tonnes). The objectives of the Rhône-Alpes region also exceed current national and European goals: their goal is by 2020 to reduce greenhouse gas emissions by 40%. (Alpenenergy, n.d.)

Renewable energy sources (or clean sources) include biomass, solar energy, hydropower, wind energy, geothermal energy and heat pumps. Below you can find some types of RES with their description, advantages, and disadvantages.

## THE FRAMEWORK OF ENVIRONMENTAL MANAGEMENT

In the field, which is highly dependent on the development of new technologies, it is necessary to take care to maintain the level of investment in research and development, as this is the most important, if Europe wants to maintain its leading market position.

The European Union with other countries and regions also seeks to promote sustainable development at a global level. This is particularly important for developing countries, where coping with the adverse impacts of production activities on the environment, the impact of population growth, and the use of scarce natural resources is becoming more pressing. The European Commission is actively in international discussions as it advocates the reduction or elimination of trade tariffs on environmental goods, technologies and services.

According to Ottman (1997) most consumers are not ready to give up quality, efficiency, convenience or affordability at the expense of green consumption. She says that environmentally friendly products have a competitive price or superior primary advantage over other products, if you want to succeed in the wider market.

***We want to know what kind of price premium green products can reach on the market, to stay competitive and successful.***

Starting from the model described by Laroche and colleagues (2001) the best indicator of environmentally-friendly purchase behaviour is also a willingness to pay more for environmentally friendly product. Such readiness is essential in terms of business, as the costs of developing, production and certification of environmentally friendly product will likely to be higher than those of 'ordinary' products (Moon, Florkowski, Bruckner & Schonhof, 2002) – at least in the short term, but most likely not in the long term. This is based on the rule "**polluter pays**". According to this rule, companies (or consumers) must pay tax or pay for investments to achieve higher standards in this area if they want to use environmentally unfriendly products (e.g., certain forms of packaging).

Salzhauer (1991 in: Kassaye, 2001) states that consumers in the U.S. are willing to pay 6.6 % more for environmentally friendly products, according to some subsequent opinion polls, however, consumers in US are willing to pay for 5 % more for green products provided that the company implements one or more 4-D strategies. (Kassaye, 2001)

Furthermore, research on the impact of eco-labelling Nordic Swan, which is awarded in Finland, Sweden, Denmark and Norway, showed that this label has a significant impact on Danish consumers to buy toilet paper and detergents as well as the marginal willingness to pay more for toilet paper Swan label was between 13 and 18 % (BjØrner, Hansen & Russel, 2003).

Older findings of Coddington (Coddington in Laroche et al 2001:503) shows that in 1989, 67 % of Americans were willing to pay 5-10 % more for environmentally friendly products. Findings of Sucharda and Polonskyja (Suchard and Polonsky in Laroche and others in 2001: 503) show that environmentally conscious consumers were willing to pay 15 to 20 % more for such products. Significantly more encouraging findings were those of Myburgh-Louw and O'Shaughnessy (Myburgh-Louw and O'Shaughnessy in Laroche and others 2001: 504) from 1993, that shows that 79 % of the sample of women in Britain were willing to pay up to 40 % more for a product that would be in all respects identical to that of the brand they would otherwise prefer, if the product was proven "green".

The clustering of these findings, with the exception of the last extremely optimistic, says that a premium on the price of the same product, only "green", consumers are willing to pay is 5 to 20 %. Because there is often a mismatch between reported intention and actual behaviour, it is probably more sensible to target the first half of this range. Otherwise, this also depends on the brand positioning.

***From this we can conclude that the price has an impact on purchase intention; that by increasing the price difference between eco-labelled products and unlabelled products the level of intention for buying eco-product will fall down.***

# The history of EM

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In 1984 the World Commission on Environment and Development (WCED) was founded, with a mission to create a "global agenda for change." Based on this objective, in 1987 the Commission issued the publication "Our Common Future", also known as the Brundtland Report (WCED, 1987). The concept of "sustainable mobility" has long been associated with the concept of "sustainable development", which in 1987 the "Brundtland Commission" defined in its report "Our Common Future" (WCED, 1987) as "development that meets the needs of the present generation without compromising the ability of future generations".

The Brundtland report explored the Earth's capacity to support life, and the ways in which human activities affect the environment. Two key aspects of the Brundtland report are:

- fulfilment of basic needs of all people, especially those who are needy;
- limit the growth of technical, cultural and social.

These aspects are contrasting with respect to the constraints on growth by Meadows et al. (1972), who defined limits as purely environmental restrictions and availability of resources. In essence, in the report Brundtland Commission rejects the physical limits of growth and stresses the belief that equality, growth and environmental sustainability at the same time are possible.

In 1992 a continuation of the original publication of the limitations of growth was published, which have been influenced by – inter alia – reviews the publication of the 1972 and the public debate on sustainable development, which began from the emergence of the Brundtland report, as well as the implementation of the second United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro, Brazil. At this conference yet another important document called Agenda 21 was presented, which advocated the need for individual countries to prepare strategies and action plans to facilitate sustainability (UNCED, 1992). In contrast to the two previous publications, Agenda 21 mentions traffic and transport strategy as a tool to achieve the desired sustainability. In this document entitled "Beyond the Limits" by Meadows et al. (1992), changes in certain assumptions from 1972, reaffirms some of the decisions of 1972 and shows that some constraints on the growth have been achieved or even exceeded. Some options for sustainability have decreased, while others were opened.

Three basic conclusions, as defined by the authors in 1992, are as follows:

- Human consumption of many essential resources and production of many kinds of pollutants have already surpassed rates that are physically sustainable. Without a significant reduction in consumption and flows of materials and energy in the coming decades, a disorderly decline in food production, per capita energy consumption and industrial production will appear.
- This decline is not inevitable. To avoid it two changes are needed. The first is a comprehensive review and update of policies and practices that maintain the growth of

material consumption and population growth. The second is the rapid and dramatic increase in efficiency in the use of materials and energy.

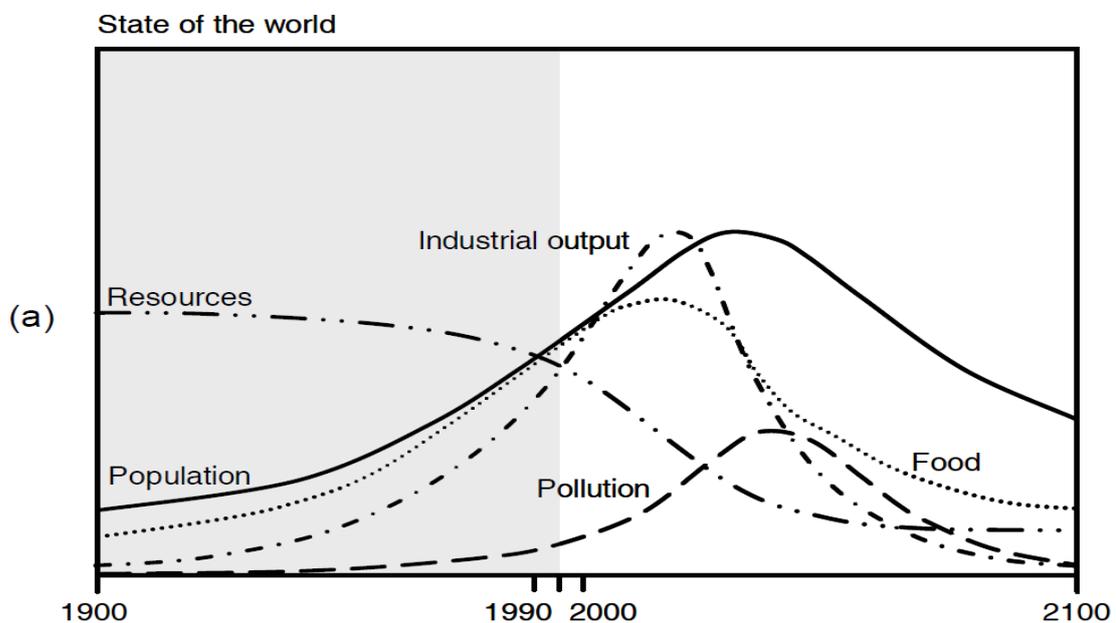
- A sustainable society is still technically and economically feasible. This concept was supposed to be much more desirable than a society that tries to solve its problems by constant expansion. The transition to a sustainable society requires a balance between long-term and short-term objectives and focus on the adequacy, equity and quality of life, rather than on the quantities and products. This requires more than productivity and more than technology: this requires maturity, compassion and wisdom.

In other words, Meadows et al. (1992) observed that human activities affect the environment, therefore, they are detecting technical, cultural and social constraints, not only the environmental restrictions on the availability of resources, as claimed in the year 1972.

These conclusions are based on extensive computer simulations of various global scenarios that were considered models of system dynamics. Due to the global nature of the transportation it did not represent specific models of work completed. The images below show three different scenarios, as raised by Meadows et al. (1972, 1992).

Scenario (a) (Figure 1) shows the standard model of 1972, which is a computer model simulating elements such as population, industrial capital, pollution and arable land. These elements are changing with the help of flows such as births and deaths, investment, exploitation, production, pollution and its assimilation. Causal relationships between them are highly non-linear. Population and industrial activity grows, until a combination of restrictions on environmental and natural resources inhibits the capacity of the sector to maintain equity investments.

Figure 3: Scenario (a)

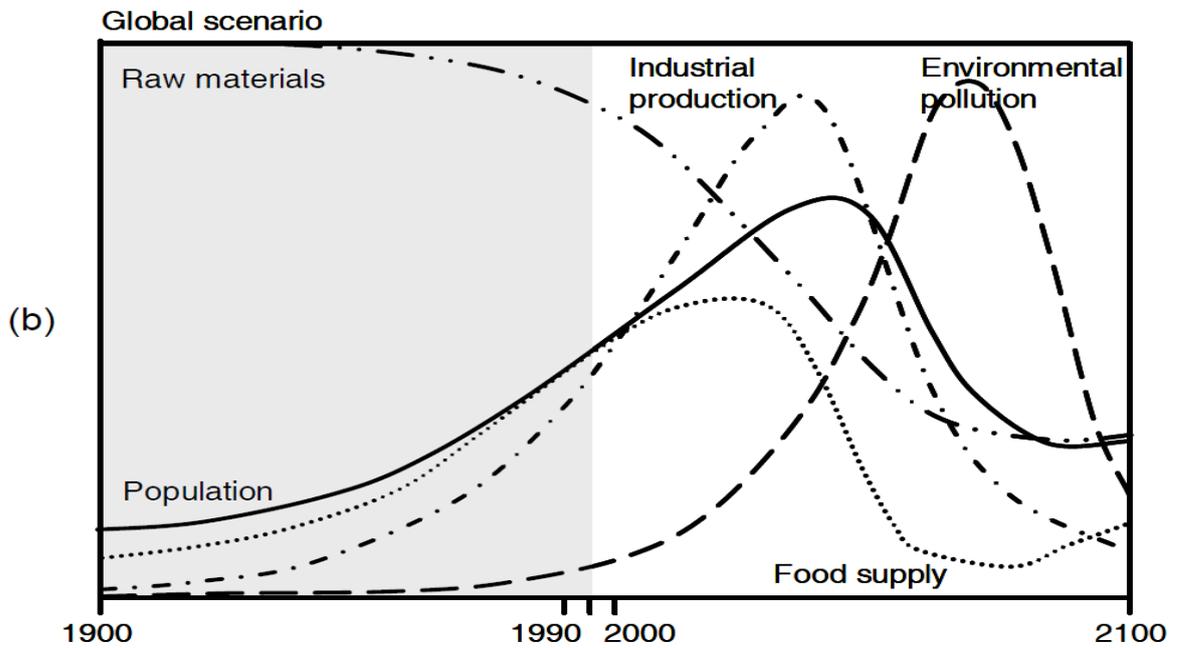


Source: Meadows et al. (1972; 1992)

In scenario (b) (Figure 2) duplicated stock of available resources is assumed. Industrial activity can grow barely 20 years longer than in the previous scenario, but otherwise there is no notable acquisition, and the decline in the use of resources is steeper. The general behavior of the model is the same as in scenario (a), exceeding the capacity and collapsing. The system draws natural

resources or pollutants at an intolerable degree, but pressures on support systems are not strong enough to reduce the rate of resource exploitation and pollution. This overrun of capacity arises from the delay in feedback - from the fact that decision-makers in the system do not get or do not believe the information on the exceeded capacity of soils, or take this information into account too late.

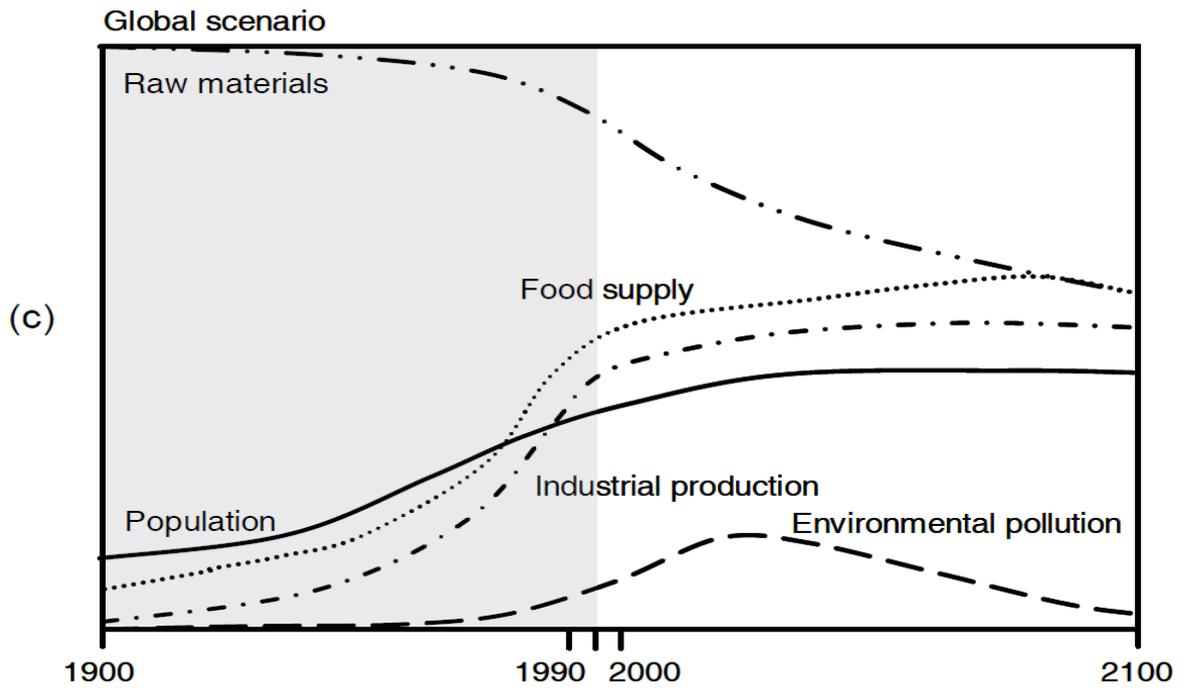
Figure 4: Scenario (b)



Source: Meadows et al. (1972; 1992)

Scenario (c) (Figure 3) assumes that the sustainable policies, including those aimed at population growth, are already implemented in 1975. Scenario shows that society achieved the desired level of industrial production per person which is able to be maintained and at the same time easily support the necessary improvements to technology. Unfortunately, Meadows et al. (1972, 1992) estimate that the start of the implementation of sustainable policies in 1992 can no longer avoid bigger problems to sustainability.

Figure 5: Scenario (c)



Source: Meadows et al. (1972; 1992)

Ten years after the conference in Rio de Janeiro, in 2002, discussion about the progress of ideas and goals set by the Brundtland Commission took place in Johannesburg, South Africa. Although the Summit was charged that it did not establish and restore the concrete objectives, it had nevertheless reached a renewed commitment to act, particularly strengthening the role of the private sector in achieving the goals of sustainability and sustainable development.

# Theoretical scope of EM and sustainability

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It is no secret that the amount of accumulated waste in Russia today is about 90 billion tons. And the situation is that distinct economic incentives for integrated waste management just do not exist (<http://kn51.ru/news/society/ecology/2013/5/02/ekologiya-kak-indikator-zrelosti-obshchestva.html>). Many people believe that there are only two ways of development: go back to primitive society or go forward to the inevitable destruction of the environment. However, there is an alternative that combines the preservation of the environment and social well-being – it is the concept of sustainable development.

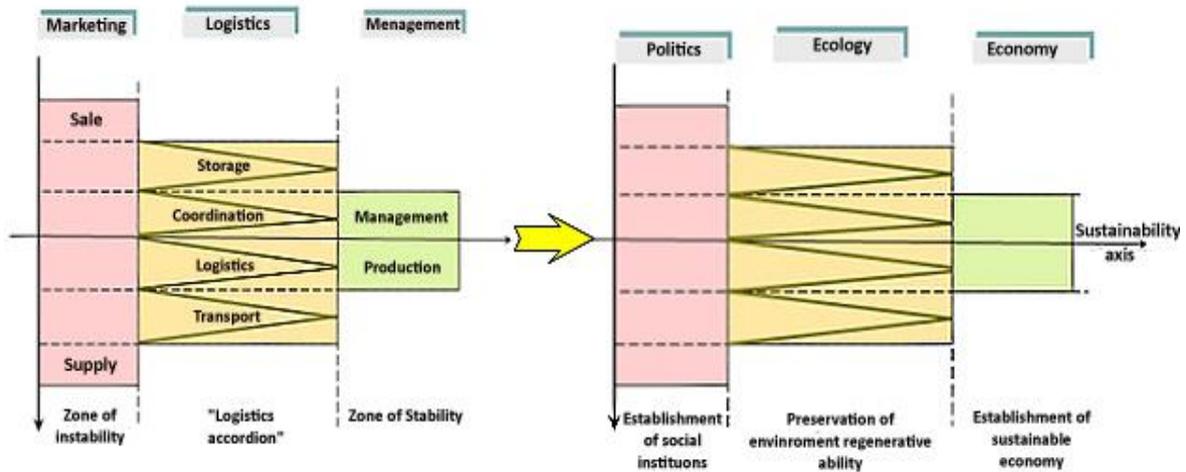
## 1 Introduction

Sustainable development today involves, on the one hand, the creation of a sustainable economy that will satisfy human needs, without resource extraction or production of waste exceeding the regenerative capacity of the environment. On the other hand, the creation of social institutions that guarantee the safety and the possibility of social, intellectual and spiritual growth.

The extent of maintaining the required stability of the individual business depends on how well built coordination of all its subsystems, or business logistics. "Logistics accordion" can stretch or shrink, depending on the management of both direct and inverse material flows. Control of return material flows is closely linked with the problem of waste management and solution of environmental problems. At present, almost all regions of Russia face the problem of placement and disposal of waste, as existing landfills around the major cities already overfilled (<http://ria.ru/danger/20100527/239219525.html>).

According to the correspondence principle of Hermes let us draw an analogy between a single business and the state in general and move on from market management concepts to the public life: in that case, the economy falls into the place of management as the most deterministic sphere of public life. Marketing's spot (most unstable management concept) is occupied by politics (social). The problem of social relations and the economy is the most important problem of society. It arises whenever a new political sphere of society forms. However, at each particular stage of society historical development, this problem arises in a new way, and at the present stage of development of society environment becomes an indicator of this problem (Figure 6).

Figure 6: Eco-logistics concept of change management in modern society

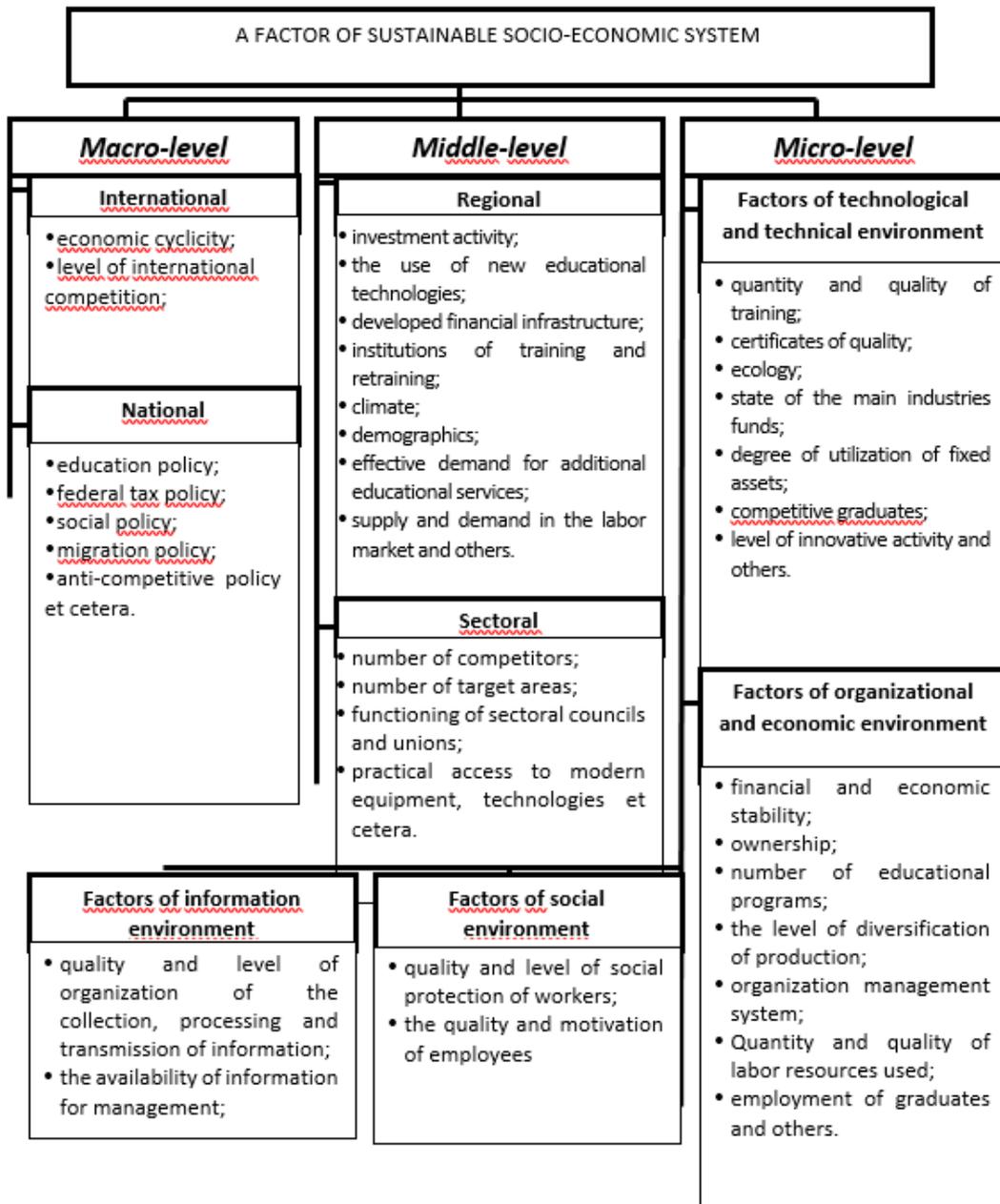


Ecology plays the role of a buffer area of social life, able to smooth out the unevenness between politics and economics. Thus ecology becomes a buffer or "stability accordion of modern society", and essentially takes the same position and plays the same role as the logistics - the role of a comprehensive indicator of sustainable development.

## 2 Functions and conditions of self-preservation and sustainability of the transport organizations in Russia

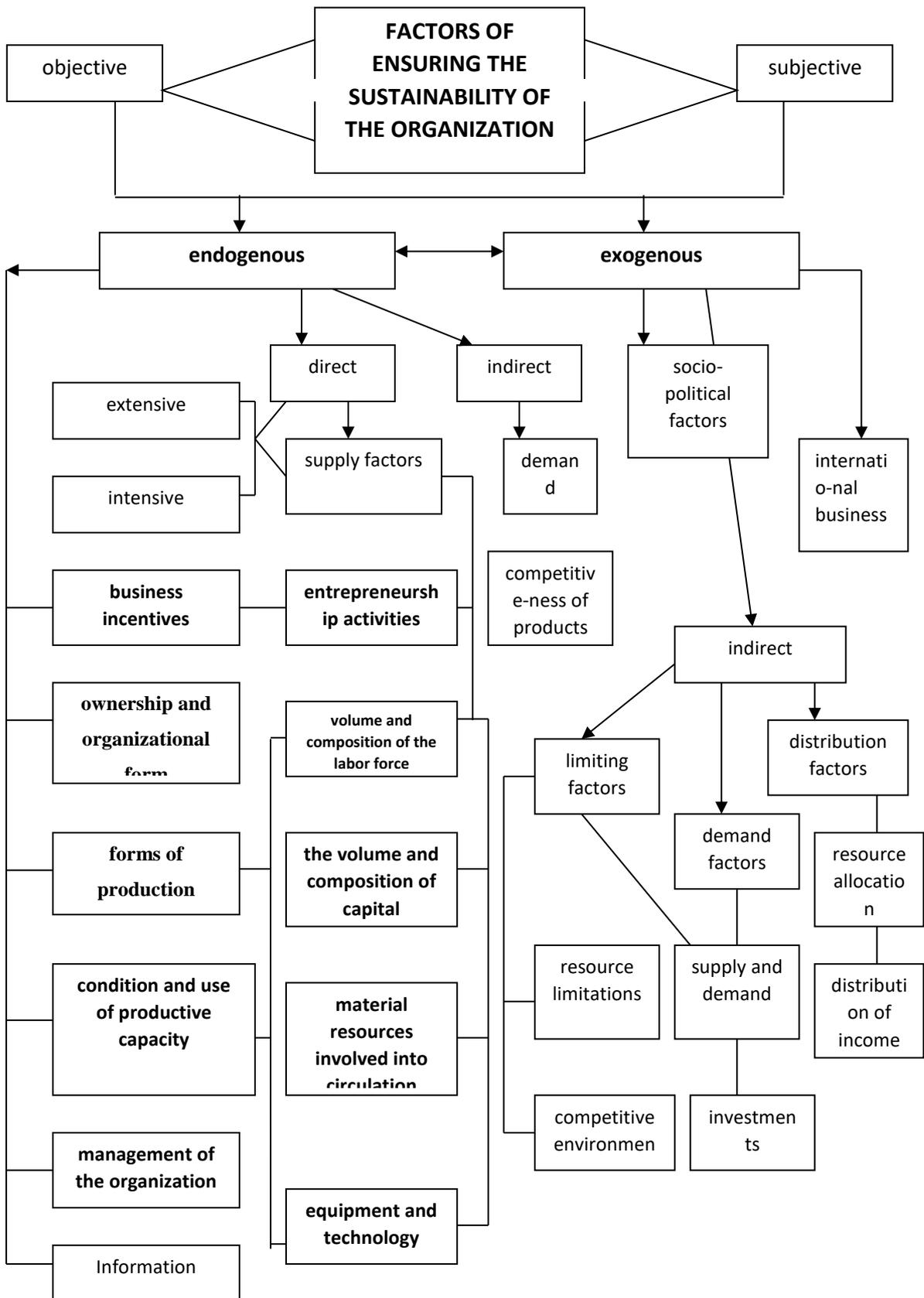
Sustainability is the concept that should be considered as a complex characteristic, because it reflects the impact on businesses by the large number of external factors and internal changes. In this regard, it is worth comparing with similar content categories. The important point is to determine the place and importance of this category among other characteristics of the organization. Analysis of factors affecting the organization as a socio-economic system is shown in Figure 7.

Figure 7: Structure of sustainability of socio-economic system



All factors must be considered in the complex, as they characterize the condition and stability of the organization, which is under the influence of internal (endogenous) and external (exogenous) factors, direct and indirect, objective and subjective, regulated market, state, and directly by the enterprise itself (Drawing 2).

Figure 8: Classification of factors to ensure sustainability of the organization



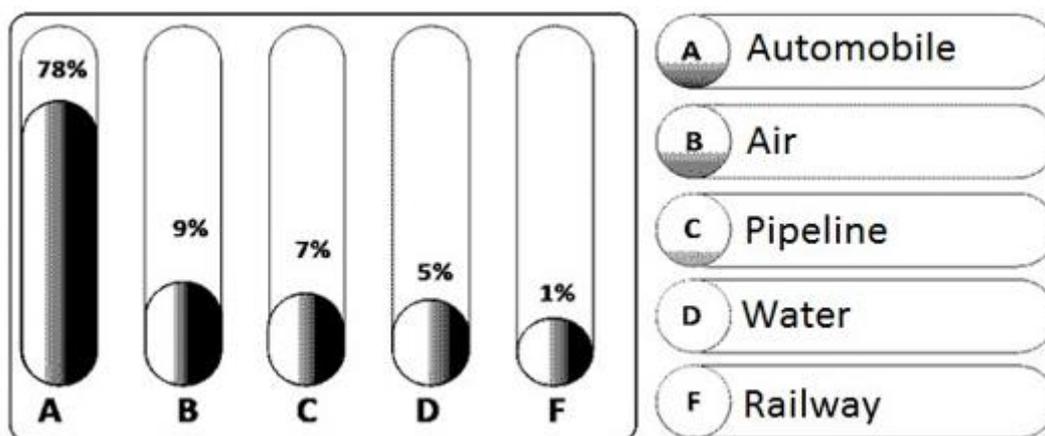
Economic stability of the organization can only be restored effective management of business as an economic system based on strategies that take into account the effect of systematic factors, including cleaner production and products.

The main characteristics of the organization are adaptability, flexibility, competitiveness, economic security, reliability, efficiency, dynamism, resourcing, environmental friendliness.

Open Joint Stock Company "Russian Railways" was established by the Government of the Russian Federation, Decree number 585 dated September 18, 2003. This was the result of the first phase of railways reform in accordance with the Russian Government Decree number 384 of 18 May 2001.

Figure 9 shows a negative impact on the environment by means of transportation.

Figure 9: The negative impact on the environment of Russian transport



In today's world, a lot of attention paid to environmental issues. Railway transport provides for the development of environmental management systems, so it is recognized as one of the most eco-efficient types of transport in the world. However, passing through the railway routes, together with the amazing beauty of the nature outside the window, we can see an ugly picture – a big amount of garbage near the railroad tracks and on the territory of stations.

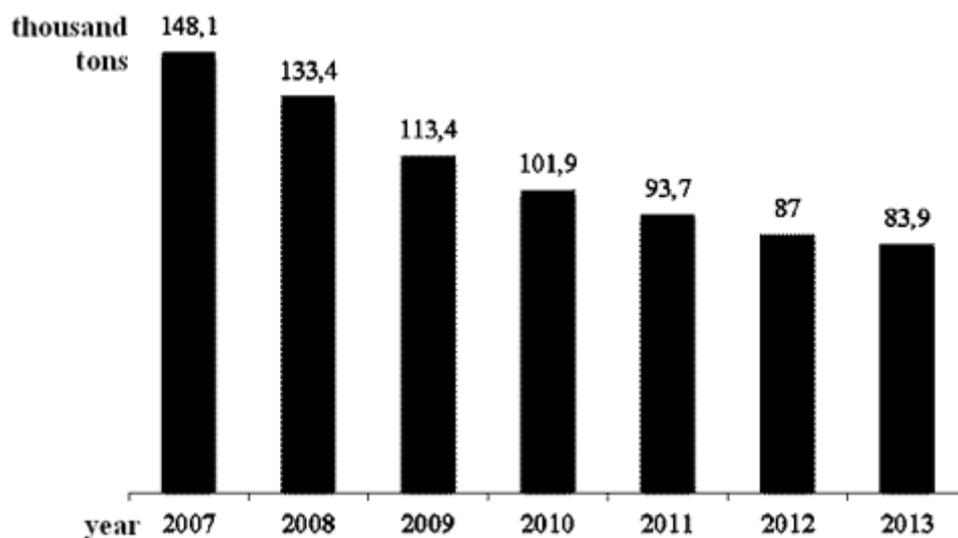
Which environmental activities are carried out on railway transport to protect our environment and to develop railway tourism? Let's have a look at the measures aimed at protecting the environment, in JSC "Russian Railways".

An important component of the development strategy of JSC "Russian Railways" is to ensure the environmental safety of production and transport complex of the company. Environmental activities at JSC "Russian Railways" is carried out in accordance with the documents ([http://rzd.ru/static/public/ru?STRUCTURE\\_ID=1413](http://rzd.ru/static/public/ru?STRUCTURE_ID=1413)):

- "Environmental Strategy of JSC "Russian Railways" for the period up to 2017 and the perspective up to 2030";
- "Strategy of development of railway transport in the Russian Federation until 2030";
- "Innovative development strategy of JSC "Russian Railways" for the period up to 2015 (" White Paper JSC "Russian Railways")"

- The main purpose of JSC "Russian Railways" in the field of ecology - the welfare of the environment and human health. To achieve this, the environmental strategy calls for:
- reducing the negative environmental impact by 35% by 2015 and by 70% by 2030;
- introduction of effective resource conservation technologies and environmentally friendly materials, sustainable use of natural resources;
- reduction of energy transport: reduction in specific energy consumption for traction 14.4%, fuel - by 9.1%;
- improving the environmental safety and social responsibility of the company.

*Figure 10: Emission of harmful substances into the atmosphere from stationary sources of structural units of the branches of Russian Railways from 2007 to 2013*



Minimizing the negative impact of "Russian Railways" on the environment is achieved by:

- introduction of innovative technologies that ensure the protection of air, water resources, increase the use and disposal of industrial wastes, reduce greenhouse gas emissions, noise exposure;
- improvement of environmental management systems;
- for environmental monitoring.

JSC "Russian Railways" there is a department of nature protection and environmental control of the Department of health, safety and environmental control. His expertise includes the organization of activities of the administrative apparatus units, branches and subsidiaries in the field of environmental protection and monitoring compliance with environmental and sanitary-epidemiological legislation in the JSC "Russian Railways".

In addition, on all railways - branches of JSC "Russian Railways" are centres of Environmental Protection (hereinafter - NTSOP) having in its structure of production environmental laboratory. NTSOP ensure environmental safety in the structural units of the branches of JSC "Russian Railways", located within the boundaries of the railways. The objectives NTSOP, first of all, include the implementation of integrated environmental policy of "Russian Railways", as well as

control over compliance with the current legislation of the Russian Federation, environmental standards and regulations structural units of the branches of JSC "Russian Railways".

Improvement of environmental performance in the JSC "Russian Railways" has become an automated system for environmental management - ASU "Ecology". Since 2012, it reflects the results of the environmental management departments of JSC "Russian Railways» ([http://rzd.ru/dbmm/download?col\\_id=121&id=72677&load=y&vp=1#4](http://rzd.ru/dbmm/download?col_id=121&id=72677&load=y&vp=1#4)).

Finally, all employees of JSC "Russian Railways", dealing with the environment, improve their skills in specialized institutions. Significant contribution to the implementation of environmental activities of OJSC "Russian Railways" was the opening June 5, 2012 in the Environmental Training Centre ([http://rzd.ru/dbmm/download?col\\_id=121&id=72677&load=y&vp=1#4](http://rzd.ru/dbmm/download?col_id=121&id=72677&load=y&vp=1#4)).

The solution to all these issues require serious collective efforts of specialists in different types of transport - both researchers and practitioners. Should be made more certainty in the disclosure of the traffic performance and its products. And for this it is necessary to provide the enterprise sector highly qualified specialists able to understand the realities of the modernization and sustainable development as a particular company and the industry in general.

# Sustainability

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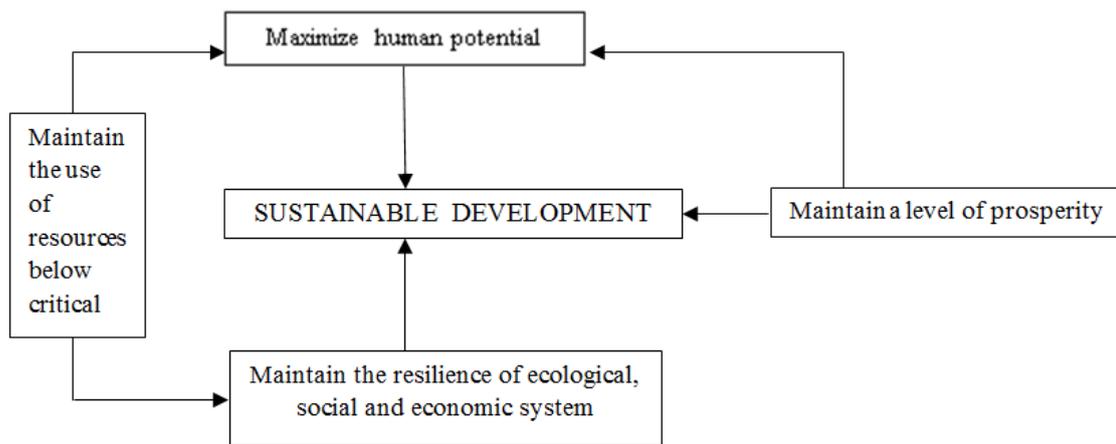
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Sustainable development aims to optimize the balance between economic, social and environmental objectives. Sustainable thinking reflects concerns about the long-term risks posed by the current consumption of resources, taking into account the objectives of intergenerational justice. This is clearly defined in the detailed definition of sustainable development by WCED (1987): "in essence, sustainable development is not a particular state of harmony, but rather a process of change in which the exploitation of resources, direction of investments, the orientation of technological investment and institutional changes are in harmony, in order to enhance the current and future potential to meet human needs and aspirations." The starting point is given by the economic and social development that meets human needs and desires, but also takes into account the natural resource base and social justice.

There is some disagreement about the meaning of the term sustainable development. This is related to different interpretations of the concepts of sustainability and development. The basic philosophy of sustainable development follows two main aspects - sustainability and development. However, the focus of most people and organizations is only on the sustainability – they interpreted the concept solely in terms of environmental conservation in 'good' condition. Sustainability is therefore a set of constraints that must be met by the company. Parallel to this, development is often seen as a process of continual economic and social changes taking place both in developed and in developing countries. Standard welfare or social welfare is improved. With respect to both aspects at the same time, the context of sustainable development is dynamic and is related to the factors that determine when the system is sustainable in terms of maximization of social welfare, or, more generally, the human potential. Such a framework is a dynamic process, not a static object optimization, and is as such based on the model of ESCAP-AITD (2001) shown in the *Figure 4* below. Sustainable level of prosperity, or more generally sustainable levels of resource use, can ensure that human potential remains unchanged or even improve over time. System's ability to absorb or assimilate internal and external disturbances and restores balance (or equilibrium) is called resilience of the system.

*Figure 11: Schematic show of sustainable development*



Source: ESCAP-AITD (2001).

## 1 Investing in Sustainable Development

Sustainable development is "meeting the needs of the present without adversely affecting the ability for future generations to meet their own needs". If we look at this from the perspective of business philosophy, we can easily say that today we should not make business decisions which will tomorrow result in us not being able to operate (at least in the normal course of business and business ethics). The company's key to success is long-term sustainable development.

In the context of sustainable development, environmental issues do not necessarily become just a cost of doing business, but also a powerful source of competitive advantage. Companies that adopt this concept can benefit more efficient processes, improvements in productivity, lower costs in ensuring compliance and new strategic market opportunities. Since we are focused on adopting sustainable development, we should follow the steps bellow:

### 1<sup>st</sup> step: Basics or greening your life

This is the most basic level of sustainable development. At this level we should keep our ethics and morals because we want to "act right" and create a proactive approach to sustainable development. At this stage, employees are aware of environmental issues, they are inspired and have power. They actively want to participate in recycling programs or internal programs to save energy. These initiatives should include all companies with offices or manufacturing that have employees who are interested in protecting the environment. Companies in highly price competitive industries may be targeted at level 1 since they would hardly introduce any initiatives that increase costs.

This level also addresses some risks. Basic projects to reduce energy consumption and increase compliance with environmental regulations can help companies remain in accordance with their clients, the government and NGOs.

### **2<sup>nd</sup> step: Greening the office**

The next level of sustainable development may require some investments, but these investments can be reimbursed if properly implemented. The investments can be minimal when compared with the increased satisfaction of shareholders or lowered market risk. Companies targeted at the 2nd level can plan a proactive approach to sustainable development, to obtain a larger market share or obtain or retain the best employees. Stage 2 includes all companies that want to protect the environment, but usually is most profitable in large commercial buildings (from 10,000 to 50,000 m<sup>2</sup>) or production facilities that wish to improve their profits, but do not have a substantial market pressure to achieve sustainable development. This rate may also be appropriate for companies with low market power, which rely on a very large customer base with their customers beginning to ask questions about their environmental friendliness.

This level could also be called the pro-active level. With clever steps to improve efforts to protect the environment, companies can reduce costs and increase the affection of their clients, so they deserve the title of "sustainability-oriented company."

Efforts to greener buildings can mean different things at different levels - from small projects to save energy to complete construction projects, including the development of the facility, water savings, energy efficiency, materials selection and quality of resources and the environment. Many projects, for example, to ensure efficient use of water and energy, will be paid within a reasonable time, certain materials and projects for the development of facilities that require investment in the facility and staff. This brings us back to the issue price by placing your company's social responsibility. This table lists some simple projects and assesses various initiatives necessary.

### **3<sup>rd</sup> step: Greening your manufacturing plant**

The third level includes companies that have a very exposed brand and to a certain extent deal with the risk of negative market reaction. These companies are looking for investment opportunities with which to achieve sustainable development, because of the pressure of their shareholders, but they do not plan to offer green products or services on the market. Branches in Level 3 include firms with increased likelihood of legal restrictions and enterprises with markets where there is extreme competition for the best employees. Procedures of greening at the third level may include advanced energy projects in construction and manufacturing, as well as prejudice deeper into the culture of the company.

Companies at this stage integrate sustainable development into their business objectives. Because of its large impact on the environment, high brand awareness, or high social responsibility such companies include environmental planning in their daily activities, sometimes even measure the progress of the company to the triple bottom line, which measures not only economic returns, but also impacts on society and the environment.

Sustainable operation exceeds the traditional mantra of "Reduce, reuse and recycle" because of two added concepts: "Change design" and "Think again". These activities include closing production loops, processing, supply chains and tracking the impact of products and services on the environment from raw material suppliers, manufacturers, distribution to end of life.

This is referred to as evaluation of life cycle assessment (LCA) and allows manufacturers to fully see the impact of their product on the environment, and that its impact on the environment is changing at all levels.

#### **4<sup>th</sup> step: Driving through the green wave**

This level represents real protection of environment. This requires companies to "do no harm" and to eliminate the potential harm already done. Companies at this level is looking for ways to invest in green products and technologies, which are then brought to the market.

This level requires true innovation and represents a new milestone in sustainable development. Environmentally friendly products, technologies and companies in the coming years are expected to stimulate billions of dollars of investment.

Most companies at the fourth level will lose a lot if they do not respond to environmental problems. These companies do not have only highly exposed brands and a large number of shareholders, but also a great impact on the environment. Most of them are dependent on natural resources and greatly exposed to legal restrictions. In addition to the essential benefits that they can bring from their responsibility to the environment, they are exposed to high risk if they do not take action.

Perhaps it is no coincidence that companies who ride the green wave for several consecutive years, significantly outpace the general market growth.

## **2 The creation of "green" team within the organization**

At the beginning of the path to environmental responsibility within the company, it is important to start with a sincere conversation about where you are and where you want to be. All businesses will not want to change their business model. Nevertheless, every company can "fix the basics" and take action to reduce their impact on the world.

This process starts with a multidisciplinary team within your organization, which should have a certain amount of passion in the field of environmental protection. This team should obtain some important rules to become "green team" (see *Table 2*).

*Table 3: Rules to achieve »green team«*

|   |  |
|---|--|
| <b><u>Rule number</u></b><br><b><u>1</u></b><br><b>Management support</b> | <b>One team member must be part of the leadership that will not only represent the opinions of the management team, but will also allow access to the management team and quick decision-making. The objectives of this team member are:</b> <ul style="list-style-type: none"><li>• <b>Openess to listening to ideas in the team</b></li><li>• <b>Routing talks towards plans that can be carried out</b></li><li>• <b>Determination of expectations for the direction of the team and the resources available.</b></li></ul> |
| <b><u>Rule number</u></b><br><b><u>2</u></b><br><b>Commitment</b>         | The management must undertake the evaluation of proposals and discoveries of the team, and take action.  |

|   |   |
|---|---|
| <b><u>Rule number</u></b><br><b><u>3 Diversity</u></b>                                | Other team members should be from different departments, groups and situations.                   |
| <b><u>Rule number</u></b><br><b><u>4 Size</u></b>                                     | Size limit should be of 10 or 12 people.  |
| <b><u>Rule number</u></b><br><b><u>5 Release the creativity of your employees</u></b> | This is an excellent opportunity to take advantage of resources that you spend a lot of money on. |

### 3 How to get success in the organization

We offer three suggestions for successful adaptation of sustainable development of your company:

|   |  |
|---|--|
| <b><u>Suggestion 1:</u></b><br><b>See the forest and not the trees</b>                      | <b>In terms of environmental protection or financial point of view, sustainable development can succeed only if it has a long-term strategy. Companies have a strategy and invest in activities such as financial management, product development, etc ... Now it's time to turn the environment into long-term business planning. Every day, companies spend millions (or billions) on inventory management, order processing, and supply chain management. Why don't we treat the planet's natural resources as a supply chain that can be controlled, and as stock you can measure and control?</b> |
| <b><u>Suggestion 2:</u></b><br><b>Benefits overestimated regardless of the consequences</b> | Much research has already been conducted to evaluate the benefits and consequences of an integrated environmentally friendly approach to business. Benefits include lower costs and increased profits, resulting in constant risk of loss of business or deliveries. Top management awaits what will be the next big innovation that will change the industry, but they should also monitor what big change in the environment will rock their world.  |
| <b><u>Suggestion 3:</u></b><br><b>Things you do not measure, you cannot control</b>         | The first step in improving the processes is the right measurement. Evaluations of life cycle assess the product's environmental impact from raw materials to disposal. We can evaluate products and understand what happens to them through manufacturing, distribution, use and disposal. With this analysis your company can eliminate the waste and costs, reduce the required amount of supplies and add value to your business, whilst reducing your impact on the environment.  |

#### 4 Sustainable product development

The green consumer is a consumer who avoids products that "endanger their health or the health of others; causing serious damage to the environment during manufacturing, use or after cessation of use; consume a disproportionate amount of energy; cause unnecessary pollution; are made from materials of endangered species or other (limited) elements of the natural environment, constitute cruel treatment of animals; adversely affect other countries" (Elkington in Strong 1996). A consumer, who would behave in accordance with this concept, would probably have to be very well informed, principled and at the same time highly motivated to make their beliefs and knowledge also "translated" to this shopping behaviour. How many consumers correspond to such a profile, thus avoiding "inappropriate" products, realized in green consumption and environmentally friendly life style, has been the subject of various studies.

#### 5 Segmentation of the green consumer

In the U.S., research was made about segmentation of the green consumer by The Roper Organization for SC Johnson & Son, Inc. (Coddington 1993) in 1990.

Consumers were segmented into four categories (Coddington 1993):

- I. **11% of the population represent the "completely faithful to green", which are the most active green consumers and their behaviour is consistent with a strong concern for the environment. They're kind of the head of the green movement among the population;**
- II. **11% of them represent "the green dollar", whose main characteristic is that they are willing to pay a substantially higher price for green products;**
- III. **The next two groups are "Shoots" and "Croakers", a total of 50% of the population, which are characterized by a dull environment, and even more faint behaviour in the green direction;**
- IV. **Finally, there are "Boreds" who simply do not believe that the individual has any significance in solving the problems of environmental pollution and refuse to pay attention to environmentally friendly behaviour.**

Some other studies (e.g., Green Market Alert, Simmons Market Research Bureau ...) (Coddington 1993) have also shown that the proportion of active green consumers in the U.S. is somewhere between 10 and 25% of the population. Next follows a large group of consumers (around 50%), which report concerns about the environment, but they very rarely translate their concerns into purchase behaviour. At the bottom there are 20 to 30% of consumers who are not interested in the environment. Coddington explains this by them being too poor to be able to focus on more than just on their own survival.

However, we must be aware that the above research was carried out in the 1990's, meaning it may not be a representative picture of today's situation. Despite some reservations, we therefore get basic information on the size of the green consumer research involved markets during the period of the nineties. However, our green consumer and the causes or effects on its

green behaviour in more detail are interested in, so we will try to explain through a variety of theories and models.

## **6 Understanding the green consumer and impacts on environmentally friendly behaviour**

For a successful green marketing business, it is important to have good knowledge of their target consumer groups and the effects on the behaviour. We are mainly interested in purchasing behaviour, namely influences on purchase intention. We will try to better understand them with the help of three theories or models:

- with Maslow's hierarchy of needs;
- the model of factors that influence consumer willingness to pay more for environmentally friendly products, Laroche and co-workers;
- Ajken's theory of planned behaviour.

### ***Maslow's hierarchy of needs***

Coddington (1993) connects the segmentation of The Roper Organization agency in 1990 with the often mentioned Maslow's hierarchy of needs or motives. The basic idea of this theory of motives is that various hierarchical relationships exist between the motives that determine which motive will take greater control over one behaviour in a given situation (Ule and Kline, 1996).

According to this theory, an individual moves across the bottom of the pyramid of needs, physiological, through the need for security, for love and belonging (social needs), the self-respect to demand self-realization, self-actualization. The need which is lower on the scale must be satisfied in order for higher ranked needs to appear (Vogrinčič-Čačinovič in Lamovec and others 1975: 295). However, this is not an absolute, complete satisfaction of certain needs before the higher appears, but it can also be a relative, partial satisfaction. With self-actualization Maslow means the tendency of people to discover, accept and express their inner nature (Vogrinčič-Čačinovič in Lamovec and others 1975: 298). These values are desirable for profiling green consumers during market research, as well as have an impact on the purchase intention. According to Ropper's segmentation, Coddington (1993) divided the segments of consumer according to the level of needs or motives in Maslow's hierarchy (also see table above). They are "completely faithful to green", that is most committed green consumers, those who have reached a level of self-actualization. These are the opinion leaders and trend setters, who are characterized by their actual behaviour or consistent with a strong concern for the environment (Coddington 1993: 81). "The green dollar" consumers have organized their life to meet the needs for respect, self-esteem, recognition and status. They are characterized by a very busy lifestyle, but are not activists. "Shoots" are most dedicated to meet the social needs of acceptance and belonging. "Croaker" and "Boreds" are poorer and more likely than others to focus on the physiological needs and security needs. "Croaker" gives more importance than other segments to security and order and to oppose higher prices, while "Boreds" are the most socially and economically deprived social groups and consequently the least environmentally active (Coddington 1993).

### ***Laroche et al's model of factors that affect the willingness to pay more for environmentally friendly products***

Laroche et al (2001) see the best evidence for the growth of environmentally friendly consumer behaviour in individuals who are willing to communicate and willingness to pay more for environmentally friendly products. Our describing and understanding the effects on the willingness and intention on buying green products will be based on their model.

The authors identified five factors that can affect the consumer's willingness to pay more for environmentally friendly products: demographics, knowledge, values, attitudes and behaviour. The following are their findings on the effects and the synthesis of these findings with the findings of some other authors who have also studied the effects of these same variables on purchase intention on green products.

#### ***Demographics***

Demographic variables in the literature found conflicting arguments. Coddington argues that greening or "a green" consumer is increasing in line with the education and income (Coddington 1993). So, higher education and higher incomes should also mean more green purchasing behaviour. This is also consistent with Ropper's survey (1990), in which the author describes the segmentation in detail. However, research of Berkowitz, Lutterman and Henion (1968 and 1972) did not confirm the hypothesis of a greener shopping behaviour of consumers with higher incomes. Sandahl and Robertson (1989) have even found that environmentally conscious consumers are even lower educated and have lower income than the average American. Therefore, Laroche et al (2001) conclude that income and education are not a good indicator of environmental awareness and green purchase behaviour.

Coddington (1993) also argues that women would be more "green" than men, followed again by contrary research of Reizenstein and Balderjahn (Coddington 1993, Reizenstein and Balderjahn in Laroche et al, 2001: 505).

As we can see, many of demographic variables on environmentally friendly behaviour contradict each other, as well as many of the authors' opinion that demographic variables are less important than knowledge, values and attitudes in understanding the eco-conscious behaviour (Laroche 2001) and the value demographic variables in profiling green consumers is low (Schlegelmilch and others 1996).

#### ***Knowledge***

According to Laroche et al (2001), knowledge has a significant impact on how consumers gather and organize information, how the information is used in the decision-making process and how consumers rate products and services. However, despite the importance of knowledge in the decision-making process Laroche et al (2001) as well as Martin and Simintiras (1995) report the results of research by different authors, who oppose the findings on the impact of environmental knowledge, ie knowledge about environmental matters (e.g., knowledge of the issues associated with environmental pollution, knowledge of energy saving and recyclability, product knowledge, energy-saving, made from recycled materials) on consumer behaviour. Dispoto (1977) and Chan (2004), for example, note that knowledge of environmental protection is a good indicator of a more environmentally friendly behaviour, while a whole group of researchers (Muller and Taylor 1991; Schahn, Holzer 1990) note that such knowledge has little effect on behaviour (Martin and Simintiras 1995 17 and Laroche and others 2001: 505).

The important findings of Kilkeary (1975) and Coddington (1993) are, that those who have the most knowledge about possibilities of actual savings due to conservation, also practice the green way of life, and that 34% of parents covered in a survey in New Jersey have changed their shopping habits due to new information on the impact on the natural environment, they got from their children (Martin and Simintiras 1995, Coddington 1993). This means that in addition to knowledge about the actual benefits of environmentally friendly behaviour (in this case, the direct benefits to the consumer) the knowledge gained from credible sources can have a great impact to more environmentally friendly behaviour.

From these findings, it is very difficult to conclude whether knowledge affects the willingness to pay more for green products and environmentally friendly purchasing behaviour. Given the contradictory findings we may assume that there is an influence of knowledge, but the link with environmentally friendly behaviour is not strong.

### ***Positions***

"The positions are predispositions of individuals in a positive or negative response to certain events or situations in the social world" (Rosenberg and Hovland in Ule and Kline, 1996: 170) and have an impact on the consistency of human behaviour. It consists of cognitive, emotional and conative components. The cognitive component represents knowledge, attitudes, experiences, information in regard to the object, event, person or situation; emotional represents positive or negative evaluation of the object; and conative the disposition of behaviour in a certain way (Ule and Kline, 1996).

Laroche et al (2001) in their research note that the positions are good predictors of willingness to pay more for environmentally friendly products. They studied the positions, which are, as they say, the most studied in the context of studies of green purchase behaviour. These are:

- importance that consumers attach to environmentally friendly behaviour for themselves and for society at large, and
- how comfortable / uncomfortable, convenient / disturbing consumers perceive such behaviour.

Laroche et al (2001) found that consumers who are willing to pay more for green products perceive today's environmental issues as very serious, and also believe that corporations do not behave responsibly towards the environment enough (Laroche and others 2001). On the other hand, consumers who do not have green buying habits, perceive environmental problems as something that will resolve itself, or they feel that the solution to the latter is the responsibility of governments and corporations.

The finding that green consumers are of the opinion that corporations do not behave sufficiently environmentally friendly is consistent with our findings at the beginning: that organizations and companies will be increasingly expected to do environmentally and socially responsible business.

### ***Behavior***

Consumers who take into account the environmental aspects of their consumption when purchasing are expected to pay more for green products (Laroche and others 2001). However, Laroche surprisingly finds that the willingness to pay more for green products, recycling and buying more environmentally friendly products are not significantly associated. This means that

we have to be careful when we think of the conclusion of the specific environmentally friendly behaviour from the already established another environmentally-friendly behaviour of individual consumers. We conclude, therefore, that environmentally friendly behaviour (e.g. recycling) does not affect the purchase intention on green products.

# Green product

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According to Kotler (1998) the product is the first and most important element of the marketing combination. Product strategy should include consistent decisions "about the product combination, group of products, brands, packaging and labelling." (Kotler 1998: 459). After we identify green products we will especially be interested in specific strategies for developing green products and packaging and green brand positioning.

Shortly green products can be labelled as more durable, non-toxic, made from recycled materials and have less or only necessary volume of packaging (Ottman 1997: 89). Broader definition is given by Peattie (1995) who also considers the social dimension under the concept of green. He considers the product or service as green, where its effect on the natural environment and its social impact in terms of production, use or disposal, is significantly improved with respect to conventional products and services (Peattie 1995).

Green product strategy should be implemented through:

- Development of green product,
- Green brand,
- Eco-label and
- Eco-design.

## 1 Development of green product

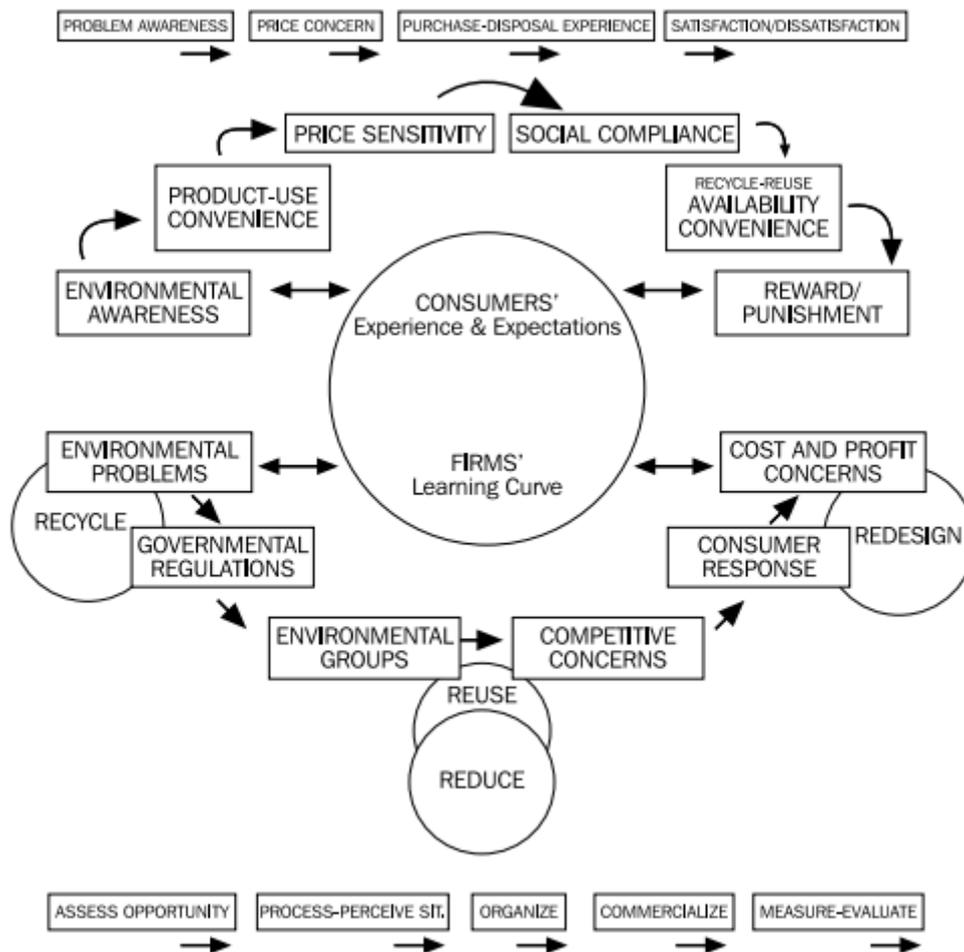
Ottman (1997) suggests the following strategies for developing new green products and packaging:

- 1) reducing the direct environmental impact (reduced or disposed pollution of soil, water, atmosphere due to the use of pesticides, uncontrolled deforestation etc.).
- 2) use of renewable raw materials;
- 3) reduction in the volume (size) of the packaging;
- 4) cooperation on the conservation of natural resources, habitats and endangered species;
- 5) the use of recycled material;
- 6) products should be effective and economical energy consumers;
- 7) maximization of consumer safety and the environment;
- 8) products should be durable and permanent;
- 9) products and packaging can be recharged using;
- 10) products should be recyclable, corrected;

- 11) products should be safe, harmless even after cessation of use (e.g. biodegradable);
- 12) products and packaging that can be decomposed into compost.

As you can see, development also includes consideration of the extent and type of their packaging. Strategy to reduce its negative impact on the natural environment is called 4-R: redesign, reduce, recycle and reuse. (Kassaye 2001: 445)

Figure 12: Consumers' expectations vs. companies' learning curve



Source: Kassaye 2001, 446.

Listed instructions for the management of packaging are therefore part of the development of green product, taking into consideration both the design, manufacture, distribution, use and decommissioning and recycling of such products (Ottman 1997). The problems of pollution of the natural environment are by nature holistic, so also the planning of green product needs a holistic approach, taking into account environmental impacts throughout the life cycle of the product (Lippke 1994).

The quality and performance of products in terms of satisfaction of consumer needs should not be neglected. An example of when environment efficiency and effectiveness for the consumer in terms of the functional properties of the product go hand in hand, are showers, faucets that reduce water consumption and at the same time cost, non-toxic products for the garden that are safe for children, etc.

When we talk about the development of green products, it is worth mentioning that the development and production of green products represent an additional investment and higher costs. Despite the fact that, for example recycling aluminium cans is cheaper and less energy intensive (uses 95% less energy) than the production of aluminium cans, the investments in the development and production of green products or restructuring of the company in a more economical and ecological use of energy are profitable only in the long term. These higher costs would be dangerous to pass directly to the consumer.

**Green brand**

After development of green product is “finished” we should consider differentiation of our green product. Therefore, we should create a green brand.

*“A brand is a name, term, symbol, design or a combination thereof, designed to identify the product or services of one or group of sellers and differentiate products or services from the competition.”* (American Marketing Association in Kotler 1998: 444).

Figure 13: Best global green brands in 2013



Source: [Strategikas], 18 June 2013.

Although brand loyalty, according to Christopher (1998) is no longer as strong as before, the brand as a kind of contract with final consumers still remains a vital element of competitive advantage. Brand simplifies the decision-making process, by offering the consumer a sense of security and consistency (Palmer 1996). It is kind of a promise by the seller to consistently offer

certain features, benefits and services to the buyer. Six areas need to be taken into account: attributes, benefits, values, culture, personality and user (Kotler 1998).

Benefits that a brand can have for the consumer may be tangible or intangible. Christopher (1998) believes that brand loyalty is more a subject of the tangible benefits or values, that is, the value regardless of price, usability, reliability, security and functionality, than of the intangible, emotional values.

And yet, since the choice of brand results in amplification of the consumer's perception of oneself and reflect their values and lifestyle (Palmer 1996), in addition to expressing his / her social / environmental consciousness, it is definitely important that the positioning of green brands considers both the reasonableness of emphasis on the properties of functional and emotional benefits of the brand.

When positioning the brand, it is as part of the brand identity and range of values that is actively communicated to the target segment (Aaker and Joachimsthaler in Hartmann and others 2005: 10). In the case of green brand this means the differentiation of the trade mark on the basis of its "consistency with the environment" and effective communication. Hartmann et al (2005) studied which attributes should such this communication emphasize. They compared the performance of green brand positioning based on its functional properties and on the basis of emotional benefits, in short, emotional and functional positioning strategy. They found that three types of potential emotional benefits as the basis for emotional positioning of green brands can be used:

- 1) a feeling of comfort due to altruistic acts; satisfaction of a conscious consumer in order to contribute to the common good (the state of the natural environment);
- 2) satisfaction as a result of visible green consumption; express themselves, their beliefs, lifestyle is socially valued, approved;
- 3) experiencing feelings and emotions that are usually associated with contact with nature (pleasure, joy ...).

### ***Eco-label***

Labelling of organic products with the eco-label, mark or symbol may be one of the ways in which a company seeks to influence consumers with information on the impact of the product or non-impact on the natural environment. It is a kind of bridge between the manufacturer and end consumers, which should increase the benefits and reduce the costs of finding and purchasing environmentally friendly product.

Figure 14: Examples of eco-labels



Source: [comunidad ism], 15 April 2013

However, the benefits of labelling of a product as an eco-label for the consumer, in addition to lower costs of search and purchase of environmentally friendly products, include the possibility of self-expression, their beliefs and the benefits of positive social identity, membership in a particular social group (Zadek and others, 1998). Authors of the report of the European Commission of the social labels called this benefit the “mirror effect”. This coexists with the effect of the window, which means information about how the product was manufactured, the implications of its use (and removal from use) on the environment. From this perspective, it is important to notice credible information in an attractive format and not the full range of technical information (Zadek and others 1998). The scope and content of information should also be adjusted to the level to which our target segment is informed about given issues or relevance of the environmental issues to which the eco-label relates.

Zadek et al (1998) identified five different labelling initiatives:

- self-declaration of individual producers;
- initiative of individual industrial sectors;
- partnership of civil society organizations with the industry;
- initiative of civil society;
- government initiative.

One of the essential elements of an eco-label, which an independent organization awarded to a product of a specific company, is the label that shows who conferred it, as this acts as a kind of guarantee to the consumer that the product meets the standards set by the independent entity. Thus, the eco-label can also be an approval of other marketing communications, to which the company communicates its environmental responsibility.

Table 4: Guidelines for maximum utilization of eco-labels

| <b>Guidelines for maximum utilization of eco-labels:</b>  |
|---|
| <b>Selection of such an organization which enjoys great credibility and uses methodologies that are recognized by leading environmentalists and relevant actors in the same industrial category</b> |
| <b>Education of consumers about specific criteria, to which eco-label is based, and about the responsible use of the product</b>  |
| <b>Commitment to protecting the natural environment should be reflected in other company activities; Eco-label is just an extension of these activities</b>   |
| <b>Marketing communication eco-labels, which raised the value of its promoting in advertising and other market communication activities.</b>  |

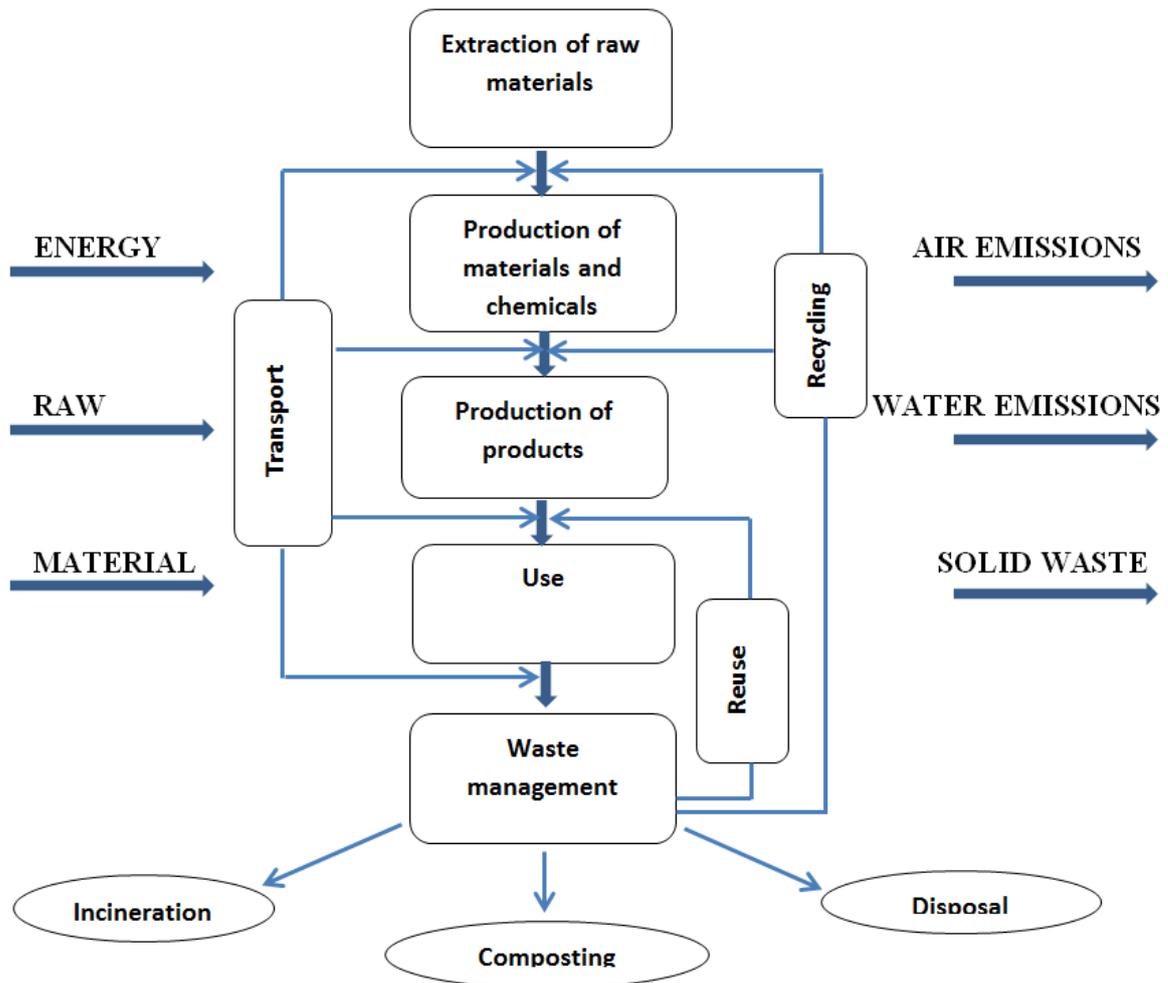
Source: Adapted from Ottman, 1997.

### ***Eco-design***

Since we presented green product, its development, creation of green brand, and the benefits of eco-labelling, we should also mention eco-design, as a prevention category.

The design of products according to their impact throughout the life cycle is of great importance for the environment and use of natural resources. Influence of the product is reflected in acquiring raw material sources, production of materials, chemicals, components and finalization, as well as the distribution, use and after use, so it is in the design of the product we need to follow all these aspects. The effectiveness of the waste management system depends on the very concept and composition of the product identified in the development stage. All the products do not affect equally the environment at all stages of the life cycle. Ideally, there would be less impact on the environment at every stage of the life cycle, but every organization is usually directly involved in only one phase of the overall environmental product life cycle. However, since the environmental profile of a product influences the entire production chain, it makes sense to study their impact on the production, distribution, on the user level, and after its use. For the products of electrical and electronic industries that use energy, the concept of environmental life cycle is directly transferred to the regulations, and is also one of the decisive criteria in green public procurement. Figure below shows a simplified diagram of the environmental life cycle and its basic phases.

Figure 15: Schematic diagram of the basic stages of the product life cycle environmental



Source: Radonjič, 2012.

There are four different approaches to eco-design of products. Existing products can be adapted to current legislation or faster feasible measures. This approach improves the environmental performance of products only to a limited extent. In the second approach, the concept and execution of the product are the same, but there are reflections on the overall structure needed, about the basic materials and raw materials of greater energy efficiency in different stages of the lifecycle. The third approach represents a completely new concept of manufacturing of the product; the fourth approach is a systemic approach, which involves innovative solutions involving the entire production process and organizational and infrastructure changes.

For truly effective design of environmentally friendly products, it must be based on adequate relevant data obtained from analysis based on environmental lifecycle of the product. In the implementation of eco-design products, different methods or tools and guidelines may be used. The most known among them is the method of LCA (Life-Cycle Assessment).

Figure 16: Life cycle assessment



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<http://www.coldstreamconsulting.com/life-cycle-analysis>

Source: [Coldstream consulting], n.d.

# Corporate social responsibility

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Many social changes, like changes in values and the need for ethical action, the phenomenon of socially and ecologically conscious consumer, the rise of enlightened capitalist globalization, and the declining rate of uncontrolled information, are also reflected in the business world. Socially responsible action in the world is becoming imperative, and the critical role of consumers, employees and non-governmental organizations allows that socially responsible operation are fair and credible.

## 1 Introduction

Corporate social responsibility is a concept that is increasingly encountered in the business sphere. Corporate (or organizational) social responsibility of the organization is its ability to use knowledge in practice on corporate social responsibility in its activities. It is one of key elements of building success and reputation of modern organizations, and it means awareness that the organization is responsible for their actions or solving problems that affect people and the wider business and social environment. Even organizations interpret social responsibility in different ways, depending on the organization's goals, values and the culture of top management. In supply chains, linking a number of different organizations from different branches, with different goals and different styles of management, a common understanding of the concept of social responsibility becomes an even greater challenge for all stakeholders.

Partly, a big step in the field was the publishing of ISO 26000 standard, adopted by the International Organization for Standardization, covering all aspects of social responsibility, which should take into account the organization in its operations. It is a standard consisting mainly of guidance and principles, and is not meant to provide certification for organizations. One of the most important contributions of the standard is a single definition of social responsibility, which is as follows: "Social responsibility is responsibility of the organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour that:

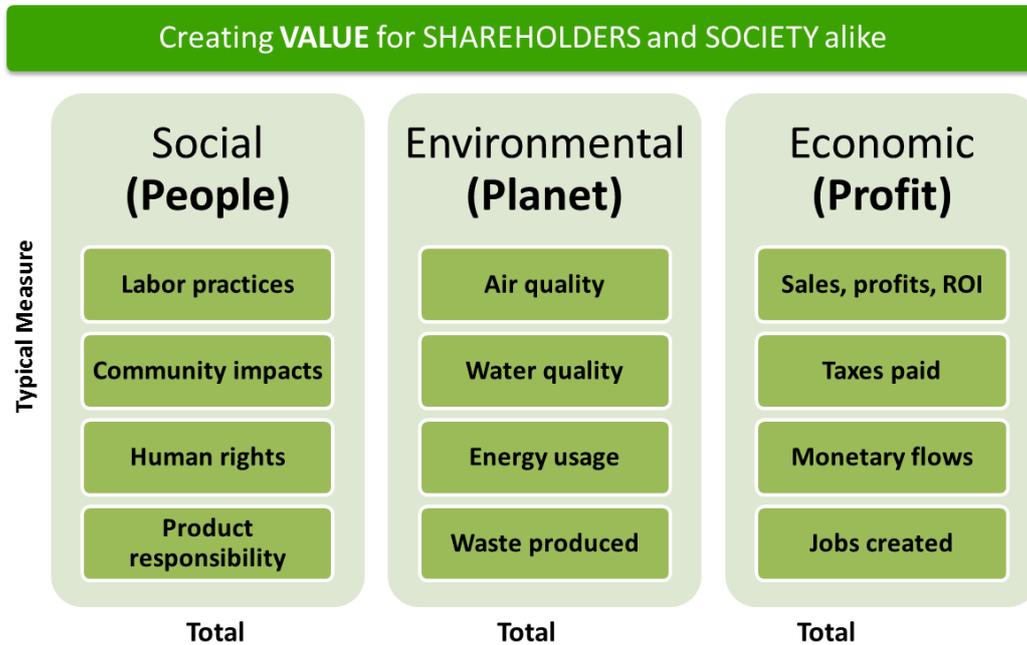
- contributes to sustainable development, including health and the welfare of society;
- takes into account the expectations of stakeholders;
- is in accordance with applicable laws and consistent with international norms of behaviour;
- is integrated throughout the organization and reflected in its internal relations. "(ISO, 2010).

This definition follows the so far existing definitions of various organizations such as the European Commission, the World Business Council for Sustainable Development and Global Reporting Initiative, which is a key emphasis on providing optimal three key areas according to Castka and Balzarova (2007): economic, environmental and social. Elkington (1998) called this

triplicate of successful and responsible business the 'triple bottom line' or the concept of "People-Planet-Profit".

Figure 17: Triple bottom line

## Industry Standard – Concept of *Triple Bottom-line*



Source: [Basis Bay, Reengineering IT], 20 September 2014

Figure 18: The relation between TBL, sustainable technology, and standards on sustainable development



Source: [Carpets Inter], 11. September 2014

In this context you should consider five priority areas presented in *Table 5* below.

*Table 5: Five priority areas within the context of TBL*

| 5 PRIORITY AREAS              |
|-------------------------------|
| Human Rights                  |
| The rights of employees       |
| Protection of the environment |
| Inclusion in the community    |
| Relationships with suppliers  |

The basic operating principles of the organization, as defined by ISO 26000 are (ISO 2010):

- responsibility (particularly for its impact on society, economy and environment)
- transparency (particularly with regard to their decisions and activities that affect society and the environment)
- ethical action (based on the values of honesty, fairness and integrity)
- respect the interests of stakeholders,
- compliance with laws, regulations,
- respect for international norms of operation
- respect for human rights.

It is important that the ethical operation of the organization defined by ISO 26000 as "operation, which is in accordance with the accepted principles of right or good behaviour in the context of a particular situation and is consistent with international norms of behaviour" (ISO, 2010). Sustainable development is a key component of corporate social responsibility, and ISO 26000 defines it as "development that meets the needs of the present without degradation of the ability of future generations to meet their own needs" (ISO, 2010).

However, in today's world where consumers require from suppliers that products and services are the best at the lowest price and satisfy a wide range of additional requirements, manufacturers and service providers are faced with new challenges. Another, opposite aspect is the fact that the activities of suppliers and intermediate customers in supply chains directly reflect on the reputation of the final seller and the reputation of the products or services offered on the market. The most famous example of this kind of unethical behaviour by suppliers, which has a strong impact on brand image and the final seller, is an example of Kathie Lee Gifford brands and companies Wal-Mart, which has been described as Boyd Spekman, Kamauff and Werhane (2006). The company marketed the brand as products that are made exclusively in the USA, but following the disclosure of exploitative production facilities in Honduras, the consequences were so inclusive that they harmed not only the names of companies and brands, but it even caused the exclusion of the company's shares from certain investment portfolios. This of course is not an isolated example, this type of cases often occurs in supply chains throughout the world.

We can conclude that the monitoring of the activities of suppliers throughout the 'downstream' supply chain is crucial to the operations of the entire chain and the final seller as well as the reputation of all links in the chain. Currently, the most established way of monitoring all activities of the supply chain is a structured approach to risk management throughout the supply chain. And vice versa - if organizations want to act socially responsible, they must include the risks

arising from the legality of socially responsible business and integrate them into risk management. Faisal, Banwet and Shankar (2006) have identified 11 factors that affect the performance of risk management throughout the supply chain, where one of the most important ones is social responsibilities of all links in the chain. The most important is the awareness that the actions of the organization and supply chain impact a wide range of stakeholders and, consequently, total awareness of the importance of social responsibility and the implementation of measures for the common pursuit of the objectives of social responsibility.

It should also be understood that socially responsible supply chain can be developed only on the basis of socially responsible organizations; therefore, individual companies must first provide for its adequate social responsibility, only then they can begin to build a socially responsible chain.

Spence and Bourlakis (2009) have identified four necessary conditions for the successful implementation of CSR in the supply chain:

- the commitment of all links in the chain to the common objective of social responsibility,
- legitimacy and possibility for all links in the chain to express their views and ideas,
- genuine partnership approach,
- permitting different approaches to CSR individual links in the chain.

We can conclude that the link between supply chain management and CSR does not entail a substantial shift in the management of mutual requirements and relationships; it just means upgrading and expansion. This facilitates organizations and supply chains to introduce the principles of corporate social responsibility in their relationship. Although the principles of socially responsible business can be introduced gradually, the common final goal must be to achieve a level of corporate social responsibility of all organizations and supply chain as a whole that will provide their economic survival and the preservation of the social and natural potential in the environment in which they operate.

A comprehensive review of its value chain manufacturers may begin to ask questions about the environmental improvement of the company and propose suitable alternatives. For example:

- Where the materials come from? What are the policies for the protection of the environment from suppliers?
- Which emissions are released during the production or manufacture?
- How much fuel will be used during the product use? What are the costs and impact on the user?
- What are the emissions? Or the user will be exposed to the consequences?
- What happens when the car is transported to the dump? Is it possible to recycle anything?

## **2 Corporate Social Responsibility and changes in the operation of businesses**

On the one hand, opponents of CSR argue that it is a fad that is not new in business philosophy, but only one of the tools of marketing. Despite the criticisms of CSR concept, the voice of proponents is growing stronger. Experience shows that social responsibility can be profitable; it improves the image and creates a positive image in society, providing better staff, partners, investors, funders, it reduces the negative effects of the crisis. Today, ethical and socially responsible companies simply enjoy more support in society.

Companies with socially responsible behaviour not only achieve good effects on society and the environment, but also for themselves. By giving something to communities, they gain something for themselves.

Companies with socially responsible behaviour:

- enhance their reputation in the environment,
- pursue global business objectives,
- attract and retain a motivated workforce,
- reduce operating costs,
- support marketing objectives,
- build strong relationships with the community,
- build on existing efforts and investments in social initiatives.

***If you also want to start socially responsible behaviour you should follow four steps below (or you can follow the shortened version in Table 6 below):***

#### **1st step**

First you need to decide which social problem you are trying to solve. Experts advise that you select only a few things that you will support, preferably those that affect the community in which you operate. Be aware that choosing the purposes which are in synergy with your vision, values, products and services and can help achieve your business goals. It is also important that you choose to support issues that affect also your stakeholders and can be supported in the long run.

#### **2nd step**

Once you have selected a problem, it is necessary to decide which initiatives you will support and implement. Namely, select the initiatives that are most aligned with your business objectives, represent the best potential for a strong partnership, and with whom you already have experience. And just a hint: if you want the public to clearly associate you with one purpose, then select a number of different initiatives that support a single purpose. At the same time, you will in this way provide stronger support for this purpose, as if to focus on only one initiative.

#### **3rd step**

At this stage it is necessary to draw up a program of corporate social responsibility, which will address the problem and suggestions. It is recommended that the preparation of the program and the plan includes internal, inter-departmental teams, and partners from the community. Also you should establish clear and measurable objectives, and also it is advisable to prepare a clear communication plan. What is most important: you need to impress the top management of the company for this program even before you finally identify the objectives, the estimated budget and sources of funding.

#### **4th step**

Just as it is necessary to measure the company's results to determine whether you have been successful, it is necessary to do the same in monitoring the activities of socially responsible behaviour. Therefore, define the purpose of the evaluation, measure and report the results of operations, which is based on the objectives of the activities, monitor the situation in the field, and ultimately provide sufficient funding for this type of measurement and reporting.

Table 6: How to start socially responsible behaviour step-by-step

| Step     | What to do?                   | How to do it?   |
|----------|-------------------------------|---|
| 1st step | <i>Choose the problem</i>     | <ul style="list-style-type: none"> <li>- The problem should also affect the community and stakeholders</li> <li>- The purpose should be in synergy with your vision, values, products and services</li> </ul>   |
| 2nd step | <i>Select the initiatives</i> | <ul style="list-style-type: none"> <li>- Select a number of different initiatives that are most aligned with your business objectives, represent the best potential for a strong partnership, and with whom you already have experience</li> </ul>                              |
| 3rd step | <i>Draw up a program</i>      | <ul style="list-style-type: none"> <li>- Impress top management</li> <li>- The plan should include internal, inter-departmental teams and partners from community</li> <li>- Establish clear and measurable objectives</li> <li>- prepare a clear communication plan</li> </ul> |
| 4th step | <i>Measure and monitor</i>    | <ul style="list-style-type: none"> <li>- Define the purpose of the evaluation</li> <li>- Measure and report the results</li> <li>- Monitor the situation</li> </ul>   |

The most important advice from experts is that you take the time to prepare a formal document which will constitute written guidelines for social business initiatives, guidelines that will facilitate decisions and to reflect the unique history, culture, goals, markets and strategy of your company.

# ENVIRONMENTAL MANAGEMENT SYSTEMS

Use of state and international environmental standards is due to the truth that the concern for a clean environment has become part of the national and international competition. The results of the use of standards in developed countries are reflected in increased competitiveness, higher profits, higher process efficiency, reduced costs and greater credibility corporate image. In less developed countries, where it is necessary to update the outdated technology, the enforcement of these standards associated with complex investments.

## ISO 14000 – The purpose of environmental standard and its implementation

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International Organization for Standardization was founded with the aim to develop and introduce international trade using harmonized international standards in the field of manufacturing, trade and communications. The organization has its members in more than 120 countries whose representatives can participate in the creation of standards. ISO standards are voluntary and consensual. Countries often include these standards in their regulation and business sector (industry) often define them in the request of the market, and in both cases the use of standard becomes mandatory.

### 1 ISO 14000 family of standards

ISO 14000 is a series of environmental management standards (Environmental Management), prepared by ISO Technical Committee - TC 207 Standards ISO 14000 families are in conflict with other environmental standards focused on managing the business. Standards, do not put direct requirements for the quality of the environment, do not provide specific levels of protection against pollution, measurable operating parameters, etc. Standards help the company develop its environmental policy, by systematically implemented in the federal process. Since it is in the context of environmental management systems announced the compatibility of the operation with respect to current environmental legislation, these requirements also indirectly involved.

Family of standards has been developed in order to:

- better management of the environment,
- enforcement of general interest to the public and users of the standard,
- cost-effectiveness and flexibility, suitable for organizations regardless of size or location,

- to facilitate the implementation of internal or external verification,
- in order to ensure the scientific validity, practicality, usefulness and usability.

The benefits of implementing ISO 14000 for companies are:

- reduce the negative environmental impacts in terms of environmental regulation,
- competitive advantage at the expense of the certification of the company to an international standard,
- transparency of environmental performance, less interference and evaluating third-party
- integration of the environmental management system with existing enterprise systems management or quality management systems,
- facilitate compliance with the requirements of the environment under the current regulation.

Accepted standards are divided into two groups, consisting of:

- Standards for organizations: Environmental Management Systems, Environmental Auditing and Environmental Evaluation performance;
- Product standards: labelling the environmental suitability of the products (Environmental Labelling), the determination of impacts of products lifetime (Life Cycle Assessment) and environmental aspects in product standards (Environmental Aspects and Product Standards).

Standards of environmental management have three important components:

- 1) The program,
- 2) Education and
- 3) Knowledge of environmental legislation.

The program contains a commitment to companies that produce products or providing services with the highest quality at the lowest possible level of environmental burdens and sets out the procedures which lead to the company's goal. Effectiveness of the program also connects the involvement of employees in the environmental management system and their understanding of it, which provides employee training.

The standards also introduce environmental audits; they are routinely evaluation of the performance of the company. Based on the inventory of inputs and outputs of the system and determining the mass and energy balance point is determined inefficiencies within the system. From the conclusions of the review of the management company shall prescribe the necessary changes that will lead to the reduction of environmental impact. Based on the schedule of implementation is also provided for the following version of the review.

The standards also plan to evaluate the impact of the company's operations on the environment; this is performed by evaluating the impacts of the company's activities in relation to the environment. In the early stages of the inventory process inventory of all environmental impacts, in continuation with the evaluation of the results of the assembler determines the possible indicators of improvement.

Standard determination of the effects of the product in its lifecycle follows the idea that every product life cycle duration, which begins production, will continue to use and ends with the removal. Within each phase appear different effects of the product on the environment.

Environmental labelling standards of appropriateness introduce uniform methods for assessing the products according to their impact on the environment. Eco-labels also allow customers choice when buying products with full knowledge of environmental characteristics.

## **2 Overview of ISO 14000**

Environmental management systems introduced by standard ISO 14001 provides a framework for system and provides guidance for the implementation according to the current legal regime and calls for the development of environmental policy in companies. The standard itself does not impose direct criteria for the protection of the environment (emission, imission), but allows self-declaration adequacy, although for most companies it plans to implement control of a third party. It is the only standard of ISO 14000 family, which makes it possible to obtain a certificate of compliance, the rest are support voluntary guidelines. It plans to develop and implement environmental management system and its integration with all activities of the company.

The most important parts of this standard are:

- determination of significant environmental impacts,
- design and discusses the company's environmental policy,
- preparation of plans and procedures to improve the environment,
- review of the environmental management system of the company's management,
- completion of environmental management system.

### ***Environmental review***

The purpose of ISO standards of the implementation of environmental reviews has grown into flourishing voluntary implementation of these checks in the 80s and 90s. This concern is reflected in the shift from consensual voluntary programs to practice the application of the new standards.

**General principles of environmental reviews summarize the ISO 14010 are the following:**

---

**objectivity, independence and competence,**

**professionalism,**

**systematic procedure,**

**uniform criteria for the review findings, the quality and content of the dossier,**

**the reliability of the findings and conclusions.**

---

Procedures for carrying out environmental reviews are covered in ISO 14011. Eligibility criteria for environmental review are given in ISO 14012, which provides guidance for choosing of internal and external service providers' review. Also includes education, personal qualities and skills required of auditors.

### ***Evaluation of environmental performance***

ISO 14031 provides guidelines for setting up a continuous process of evaluation (measurement, analysis, determination) focuses on the effects of the environment, according to its own criteria. This voluntary provision helps to meet the requirements of ISO 14001 at a stage where the company carries out the process of monitoring and measuring environmental impacts relative to its own objectives. The standard is not only useful for implementing the requirements of the environmental management system, but can also be used in all types of companies as a means of measuring the impact, regardless of the size, specificity activities or operations.

The standard provides:

- Determination of the environmental impacts arising from the results of the review of the environmental management, and
- Assessment methods, which are reflected in the possibility of measuring impacts, for example. Waste reduction, efficiency of use of raw materials, tools, whereby an entity measures the environmental impacts and effects of the implementation of the system provisioning environment.

### ***Labelling the environmental suitability***

The purpose of ISO 14020 is to provide an international uniform labelling system environmental suitability of the products in which the user will be able to decide to purchase or use.

Labelling standards of environmental suitability can distinctly affect the marketing and sell the company's products. General principles are given in ISO 14020, defines the process of assessment and marking environmental suitability and impact on subsequent processes of advertising and marketing. The principles are designed with the aim to enforce accurate and validated indications and declarations, while ensuring that they are not created unfair restrictive trade conditions.

Terms and definitions are given in ISO 14021. They define requirements for products and services. Expected results include the accuracy and verifiability of statements. Include the impact of the market on reducing the negative impacts of products, processes and services on the environment. Consider options to reduce barriers to international trade.

General principles and processes of species identification can be found in ISO 14024. This standard provides guidelines for government and private organizations in developing programs assessing the environmental suitability of rewarding the designation, for example. German Blue Angel, Japanese Eco Mark, U.S. Green stamps etc.

### ***Determination of the effects of the products in lifetime***

ISO 14040 is a tool for assessing the performance of a product, process or service for the lifecycle assessment (LCA - Life Cycle Assessment). It takes into account all impacts of products or services on the environment from cradle to grave, or the lifetime of the product, from the planning to the eliminating products after the use. The process of determining the environmental impact occurs as a conceptual process or as a tool to determine the quality. The process can help in setting up a coherent process of production or the provision of services in three primary components: an inventory of impact, impact analysis and analysis improvements.

The ISO 14040 contains design of the LCA, which provides guidance of four main phases:

---

**definition of the objective and scope**

**analysis review of the effects**

**determine the impacts**

**interpretation**

---

ISO 14041 represents the execution of an inventory of the effects in the lifetime of the product. Contains: references, definitions, detailed introduction, the definition of objectives and scope determination, led to the establishment of an inventory and report on the results.

ISO 14042 comprises principles and procedures for determining the effects of which are at this stage are classified into four groups: classification, characterization and analysis of influence assessment.

ISO 14043 is interpreted and applied in determining the stage of the impact on the management, evaluation, and research in the fields of determining the environmental impact of lifetime: a synthesis of inventory and determination of the effects of the comparison areas and improvements, conclusions and recommendations.

#### ***Environmental aspects in product standards***

ISO Guide 64 is a guideline intended for those preparing standards for products. Guideline sets out the relationship between product standards and the environment. Specifies the aspects that make the product standards may lead to a negative impact on the environment. Promote the principle of environmentally pleasant design and production, reduce the use of raw materials and energy sources, taking into account impacts of products lifecycle environmental, balanced competitiveness of the products at about the same impact on the environment and other scientific methods for reducing the negative impacts of products on the environment.

### **3 The aim of Environmental Performance Evaluation**

The basis of Environmental Performance Evaluation is to define the role of business organizations toward the construction of a sustainable society. In order to determine environmental efforts, it is necessary to precisely measure and evaluate the impacts of organization's activities on the environment and the outcomes of environmental actions (environmental performance). For measuring and evaluate environmental performance the environmental performance indicators are required (EPI) (Pochyluk, Szymański 1999a, 1999b).

**Objectives and Benefits of an EPE Program:**

- **determine the effect of an organization on the environment;**
- **comparison possibility as a basis for benchmarking management, operational and environmental performance;**
- **identification of improvement opportunities for energy and resource efficiency usage,**
- **determining that environmental objectives and targets are being met,**
- **demonstrating compliance with regulations,**
- **determining proper allocation of resources,**
- **the awareness of employees increasing, and relationships with customers' improvement.**

***Environmental Performance Indicators (EPI)***

Environmental performance indicators support the efforts of environmental organizations, and give the ability to evaluation and preparation of decisions. It consists of selecting environmental indicators, collecting and analyzing data, assessing information in the light of environmental performance indicators, reporting and communication, and periodical review of the process and improvement (Jasch 2000; A Guide to Corporate Environmental Indicators Federal Environment Ministry 1997).

The Environment Performance Indicators (Table 7) (Jasch 2000):

- allow to define the organization's environmental impact;
- allow to create common information, which is equally important for the suppliers, customers, residents, communities, employees, shareholders, governmental and financial institutions;
- allow the understanding and knowing the efforts of inserted in the care of the environment;
- allow to integrate the environmental policies of the national and local governments, such as basic environment plans, and environmental activities of organizations.

*Table 7: Environmental Performance Evaluation Indicators type*

| <b>EPE Indicators</b>                              |  |
|--|--|
| <b>Environmental performance indicators (EPIs)</b> | <b>Environmental Condition Indicators (ECIs)</b> |

|  |   |
|--|---|
| <p><b>- Management performance indicators (MPIs):</b> policy, people, planning activities, practice, procedures, decisions and actions in the organization</p> <p><b>- Operational performance indicators (OPIs):</b> inputs, the supply of inputs, the design, installation, operation and maintenance of the physical facilities and equipment, outputs and their delivery</p> | <p>Provide information about the local, regional, national or global condition of the environment</p> |
|--|---|

The most important indicators needed to assess the environmental impact of company are: Management Performance Indicators and Operational Performance Indicators.

Management Performance Indicators measure methods and organizations that manage and operate resources for business activities and their environmental activities as contributions to the society. These indicators provide information about the efforts of management to influence the environmental performance of the organization. They refer to actions taken by the management company, aimed at improving the efficiency of environmental action. Illustrate the effectiveness of executives.

They concern, among others, costs associated with the implementation and maintenance of the EMS, training, staff, achievement of environmental goals. MPI indicators may be used to track:

- implementation and effectiveness of environmental management programs,
- management actions that affect the environmental effects of the organization and possibly on the environment,
- efforts of particular importance for the success of organizations environmental management,
- the organization's environmental management, including flexibility to respond to changing conditions, the achievement of specific objectives, effective coordination and problem-solving skills
- compliance with legal requirements and compliance with other requirements that organization has adopted,
- costs or financial benefits.

The examples of performance indicators management MPI:

- implementation of environmental objectives;
- environmental costs;
- participation fees and penalties in the total cost of environmental activities;
- staff training;
- participation of suppliers assessed in terms of impact on the environment;

- the degree of compliance with the environmental management system requirements;
- time to respond to environmental incidents, or time to repair their consequences;
- percent of the exercises carried out in checking the preparedness and response failures in relation to the planned showing the planned readiness;
- return on investment on projects to improve the environment;
- savings achieved by reducing the consumption of resources, pollution prevention or recycling of waste;
- income from sales associated with new product or product side designed to achieve environmental performance or the proposed objectives;
- number of press publications about the environmental performance of the organization;
- funds used to support local environmental programs.

***Operational Performance Indicators measure environmental burden caused by organization's activities, flow of materials and energy, only controlling environmental burdens.***

The Operational Performance Indicators are divided into two, general groups (Table 8) and the examples of operational performance indicators OPI for manufacturing company are presented in Table 9 (Jasch 2000; Thorensen 1999).

*Table 8: The Operational Performance Indicators type*

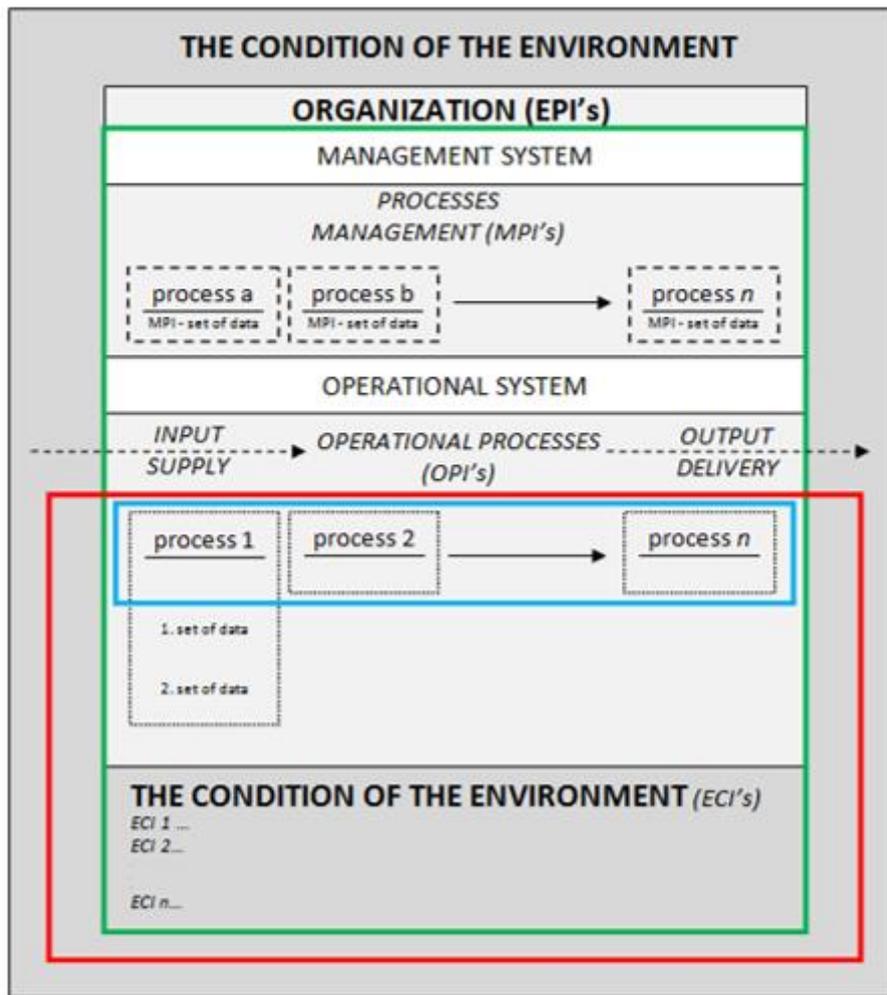
| <b>Operational Performance Indicators</b>  |   |
|--|---|
| <b>Input Indicators:</b>   | <b>Output Indicators:</b>   |
| <ul style="list-style-type: none"> <li>- total amount of energy input,</li> <li>- total amount of material input,</li> <li>- total amount of water input.</li> </ul> | <ul style="list-style-type: none"> <li>- amount of greenhouse gasses emissions,</li> <li>- chemical substances release and transfer,</li> <li>- amount of production or sales,</li> <li>- amount of waste generation,</li> <li>- amount of final disposal of waste,</li> <li>- amount of water drainage.</li> </ul> |

Table 9: The examples of Operational Performance Indicators

| <b>The example of operational performance indicators OPI for manufacturing company</b>   |
|--|
| <ul style="list-style-type: none"> <li>- annual electricity consumption;</li> <li>- energy consumption per unit of production;</li> <li>- thermal energy for m<sup>3</sup> volume of buildings heating</li> <li>- share of groundwater in the total consumption of water;</li> <li>- share of returnable packaging in the total weight of the packages;</li> <li>- material consumption per unit of product;</li> <li>- water consumption per unit of product;</li> <li>- the amount of water re-used;</li> <li>- number of emergency or non-routine operations (e.g. exclusions) during the year;</li> <li>- the total area of land used for production purposes;</li> <li>- area of land used to produce a unit of energy;</li> <li>- number of hours of preventive maintenance of equipment in the year;</li> <li>- average fuel consumption of vehicles of the organization;</li> <li>- quantity of by-products of manufactured product unit;</li> <li>- the amount of waste per unit of product;</li> <li>- the amount of waste per year;</li> <li>- the amount produced per year of hazardous waste treated recycled or intended for re-use;</li> <li>- total waste for disposal;</li> <li>- the amount of collected waste;</li> <li>- the amount of waste controlled by the license;</li> <li>- emissions of CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and other compounds into the air in a year;</li> <li>- emissions of CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub> and other compounds into the air per unit of product;</li> <li>- emissions into the air affecting the depletion of the ozone layer;</li> <li>- amount of waste per year;</li> <li>- amount of waste per unit of product;</li> <li>- amount of material headed to the landfill per unit of product;</li> <li>- noise level during the day;</li> <li>- noise during the night;</li> <li>- noise levels in certain areas;</li> <li>- the amount of released radiation.</li> </ul> |

Evaluation of Operational Performance Indicators is necessary to control materials input and released, and give the information for strategies to reduce these environmental burdens from the time of input. In the other hands these environmental indicators are designed to control the material balance, e.g. considering input and output of energy and materials into/from an entire business activity. Also those indicators evaluate the efficient and effective use of resources and energy, and the prevention of greenhouse effect.

Figure 19: The organization area of Environmental Performance Indicators evaluation



-  EPE for management process (ISO 14031)
  -  EPE for process n (ISO 14031)
  -  Life Cycle Assessment LCA (ISO 14040)
  -  Environment Management System (ISO 14001)
  -  Environment declaration (ISO 14025) with performance level (ISO 14024)
- EPI** - Environmental Performance Indicator  
**MPI** - Management Process Indicator  
**OPI** - Operational Process Indicator  
**ECI** - Environmental Conditions Indicator

**The Environment Condition Indicators ECI provide information about the state of the environment in the vicinity of the plant. They are most often used by government agencies in order to determine the emission limit.**

ECI indicators are not measures of the impact on the environment, but they can provide helpful information about the correlation between the state of the environment and the activities,

products and services of the organization. ECI indicators, in the context of environmental organizations can help with:

- identification and management of significant environmental aspects of the organization,
- assessment of the relevance of environmental performance criteria,
- selection of indicators MPI and OPI,
- setting the benchmark for determining changes,
- determining the environmental changes in time with respect to the environmental program,
- study the possible relationship between the state of the environment, and the organization's activity.

The examples of environmental indicators (ECI):

- the concentration of certain contaminants in the ambient air in selected monitoring points;
- the temperature in region at a predetermined distance from the devices of the organization;
- The weighted average noise level on the border between devices of the organization;
- the degree of transparency of air from the windward and leeward of organization's device;
- temperature of the water.

From the perspective of the diversity of indicators that are possible to identify, the organization, which planning EPE should also take into account:

- the full range of its activities, products and services,
- its own organizational structure,
- the overall strategy of the organization,
- environmental policy,
- information needed to comply with legal requirements and other international environmental arrangements,
- environmental costs and benefits,
- information necessary to analyze the financial effects on the activities of environmental
- the need for consistent information on the environmental performance - per year
- information on local, regional, national and global state of the environment,
- cultural and social factors.

The sequence of steps to follow at all stages of implementation of indicators in ISO 14031 are presented in Table 10 and Figure 15. (Pochyluk, Szymański 1999a, 1999b)

Figure 20: The model of Plan-Do-Check-Act of ISO 14031 implementation

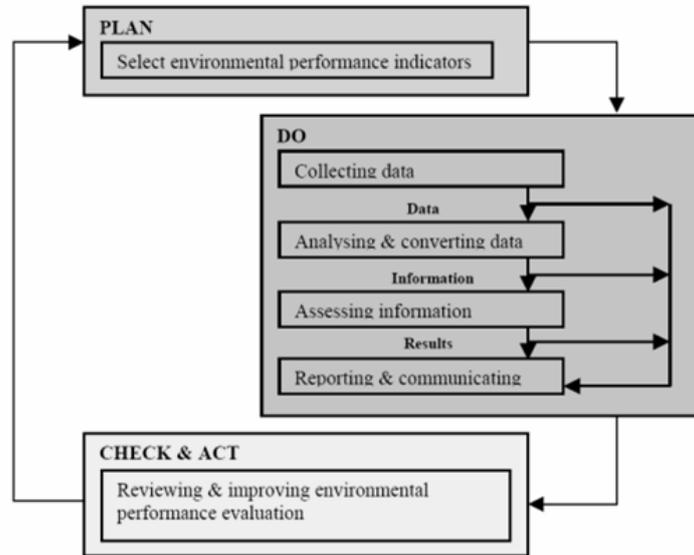


Table 10: The model of PDCA of ISO 14031 implementation

| PLAN  | DO   |
|---|--|
| Selection of indicators based on: <ul style="list-style-type: none"> <li>- significant environmental aspects in present conditions,</li> <li>- internal environmental performance criteria,</li> <li>- opinions of interested parties, based on business plan, production plan and strategy.</li> </ul> Indicators: ECI, EPI, MPI and OPI   | <ul style="list-style-type: none"> <li>- indicators evaluation</li> <li>- data updating, collecting the regulations, operating permits, EMS procedures and legal acts (production, processing, monitoring),</li> <li>- data analysis</li> <li>- evaluation of the obtained information</li> <li>- discussion of the results</li> </ul> |
| CHECK & ACT   |  |
| Review and performance improvement. Identification of opportunities of environmental performance improvement, based on: <ul style="list-style-type: none"> <li>- cost and benefit program,</li> <li>- analysis of progress in environmental performance targets meeting,</li> <li>- assessment of correctness of the environmental performance criteria and indicators,</li> <li>- quality data and methods collection .</li> </ul> |  |

Source: Pochyluk, Szymański 1999a; 1999b

#### 4 Comparison of ISO 14001 and the environmental standard EMAS

EMAS was introduced in 1993, ISO 14001 in 1996, but they are not mandatory. ISO 14001 covers a broader range of activities than EMAS. EMAS was intended only for certain specific sites of industrial activity. Methods are not competitive because EMAS has also different accents, which go beyond the depth of ISO 14001 and BS 7750, as it, for example, also requires:

- clear improvement of the environmental impacts,
- formal consent and
- reporting on environmental impacts.

Upon the occurrence of ISO 14001, the European Community in 1997 issued a provision in which this standard is recognized as one of the steps in the implementation of EMAS, thus we eliminate inappropriate duplication of activities.

On a sample of 140 EMAS certification note:

- that 47% of companies made the certification of ISO 14001, which are for the most part large companies,
- half of the 53% that have EMAS do not have the ISO 14001 standard and also have no intention to acquire it,
- 38% received ISO 14001 certification after completion of EMAS.

The adoption of ISO 14001 helped in the implementation of EMAS by raising consciousness in the field of environmental management. Both systems are complemented wherein EMAS is stricter in some areas.

EMAS is the most credible and robust environmental management instrument on the market.

The superior quality of EMAS rests upon (3x3 good reason for EMAS):

- stricter requirements for the measurement and evaluation of environmental performance against objectives and targets, and the continuous improvement of that environmental performance;
- compliance with environmental legislation ensured by government supervision;
- strong employee involvement;
- environmental core indicators creating multiannual comparability within and organizations' validated environmental statements which provide information to the general public; and
- registration by a public authority after verification by an accredited / licensed environmental verifier.

The main differences between EMAS and ISO 14001 are presented in Table 11.

Table 11: EMAS and ISO/EN ISO 14001

| Element                      | EMAS  | ISO/EN ISO 14001   |
|------------------------------|---|--|
| Status                       | Under legal bases (EU Member States and EEA countries). Regulation of the European Parliament and the Council under public law  | Under no legal bases. (International: worldwide) ISO standard under private law  |
| Organization                 | The entity to be registered shall not exceed the boundaries of the Member State, and it is intended to go towards entities and sites                                    | Does not go towards entities or sites  |
| Environmental policy         | Included commitment to continual improvement of environmental performance of the organisation   | Does not include a commitment to the continual improvement of environmental performance but of the performance of the system                               |
| Initial environmental review | Obligatory preliminary review, when is the first time that the organisation sets its environmental status   | Initial review is recommended, but not required  |
| Environmental aspects        | Identification and evaluation of the environmental aspects (direct and indirect). Establishment of criteria for assessing the significance of the environmental aspects | Required only a procedure able to identify environmental aspects   |
| Legal compliance             | Obligatory to demonstrate it. Required full legal compliance. There is a compliance-audit   | Only commitment to comply with applicable legal requirements. There is no compliance-audit   |
| External communication       | Open dialogue with the public. Public Environmental Statement (validated for verifiers)   | Not open dialogue with the public. Only is required to respond to relevant communication from external interested parts. Control by public is not possible |
| Continual improvement        | Required annual improvement   | Required periodically improvement without a defined frequency  |
| Management review            | Is wider and requires an evaluation of the environmental performance of the organization, based in a performance-audit  | Required an environmental performance in the management, but not through a performance audit   |
| Contractors and suppliers    | Required influence over contractors and suppliers   | Relevant procedures are communicated to contractors and suppliers  |
| Employees involvement        | Active involvement of employees and their representatives   | No   |

|                                   |  |   |
|-----------------------------------|--|---|
| Internal environmental auditing   | Includes: system-audit, a performance-audit (= evaluation of environmental performance) and an environmental compliance-audit (=determination of legal compliance) | Included only system audit against the requirements of the standard |
| Auditor                           | Required the independence of the auditor   | Advised the independence of the auditor                             |
| Audits                            | Check for improvement of environmental performance. Frequency required: 3 year cycle during which all areas are verified at least once                             | Check environmental system performance. No frequency required       |
| External verification             | Accredited environmental verifiers   | No  |
| Verification/ Certification Scope | Verifiers accredited according to NACE codes   | Certifiers accredited according to EAC code                         |
| Authorities are informed          | Obligation by Validation of Environmental Statement  | No obligation   |
| Logo                              | Yes  | No  |

Source: EMAS – Factsheet. EMAS benefits, May 2008

## 5 Conclusion

The purpose of ISO 14000 is to improve the environmental performance of the organization and harmonization of the different national standards on environmental management and, consequently, to facilitate the international trade. 14001 ISO standard focuses on the fundamental principles and procedures associated with environmental management, together to specifying of requirements. It is the most important of the ISO 14000 series of standards, because it determines the system itself. ISO 14031 is the guidelines for setting up a continuous process of evaluation (measurement, analysis, determination) focuses on the effects of the environment. This standard allows for that comply with the requirements of ISO 14001 at the stage where the company conducts the monitoring and measurement of the impact on the environment

The main goal of ISO 14001 implementation is to define the role of business organizations toward the construction of a sustainable society - Environmental Performance Evaluation.

***In order to determine environmental efforts, it is necessary to precisely measure and evaluate the impacts of organization's activities on the environment and the outcomes of environmental actions (environmental performance). Tools which will use during company standardization are Environmental Performance Indicators (EPI), which support the efforts of environmental organizations, and give the ability to evaluation and preparation of decisions.***

# EMAS

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The companies operating within the so-understood environment, affecting it, have led its degradation. Therefore, to prevent further pollution, a number of laws, policies and strategies were introduced. The article briefly describes all the most important rules. According to the Polish and EU legislation, these companies must take care of the environment and properly manage waste generated during the production process (Ingaldi 2013a).

The waste management is particularly a major challenge for small and medium sized company mainly due to the costs connected with adaptation to the existing legislation. Not every company can afford such changes. Very often the companies prefer to pay the penalty because, from the economic point of view, it is lower than these costs. Very often, it also appears that investments in the environmental protection repeatedly exceed the amount of any possible benefits that can be achieved. However, despite of the situation on market there are a lot of companies for which the natural environment is a priority (Ingaldi 2013b).

One of the most important element is environmental management is recycling of secondary raw materials. It helps to reduce raw materials, which in turn contributes to the protection of natural resources of the earth. It also reduces the amount of space in landfills. The use of waste, which are carriers of energy, is a component of efficient energy management (Lestyánszka Škúrková, Ingaldi 2014; Ingaldi Borkowski 2014).

Management systems, especially environmental management systems, are very helpful tools in environmental management in companies. A management system is the framework of processes and procedures used to ensure that an organization can fulfil all tasks required to achieve its objectives. The environmental management system enables organizations to improve their environmental performance through a process of continuous improvement. It is therefore important to convince managers of companies to be interested in such systems.

The object of this chapter is to help a reader to find summary about main standards of management systems, e.g.: EMAS, ISO 14000, ISO 9000 and ISO 26000.

## 1 Introduction

Excellence in environmental performance is becoming a strong business advantage. Organisations with a proactive approach to environmental challenges look for ways to continually improve their environmental performance and to communicate their environmental achievements to stakeholders and society in general.

***The Eco-Management and Audit Scheme (EMAS) is the EU's voluntary environmental management instrument that helps organisations in it. EMAS Environmental Management Systems can be used worldwide by companies and organisations of all sizes and types. EMAS registered organisations commit themselves to evaluate, manage and improve their environmental performance.***

Implementing the premium environmental management instrument leads to enhanced performance, credibility and transparency of registered organisations (3x3 good reason for EMAS).

## 2 Characteristics of EMAS

EMAS' distinctive key elements are  
([http://ec.europa.eu/environment/emas/about/summary\\_en.htm](http://ec.europa.eu/environment/emas/about/summary_en.htm)):

Performance: EMAS is a voluntary environmental management instrument based on a harmonised scheme throughout the EU. Its objective is to improve the environmental performance of organisations by having them commit to both evaluating and reducing their environmental impact, and continuously improving their environmental performance.

Credibility: The external and independent nature of the EMAS registration process ensures the credibility and reliability of the scheme. This includes both the actions taken by an organisation to continuously improve its environmental performance, and the organisation's disclosure of information to the public through the environmental statement.

Transparency: Providing publicly available information on an organisation's environmental performance is an important aspect of the scheme's objective. It is achieved externally through the environmental statement and within the organisation through the active involvement of employees in the implementation of the scheme. The EMAS logo, which can be displayed on letterheads, adverts for products, activities, and services, is an attractive visual tool which demonstrates an organisation's commitment to improving its environmental performance and indicates the reliability of the information provided.

The Unique Quality of EMAS is primarily the result of the following (EMAS. Verified Environmental Management):

- the environmental review to determine the organisation 's current status,
- consistent orientation towards continuous improvement of environmental performance,
- standardised indicators of significant environmental aspects,
- intensive participation of employees,
- an evaluation system that is both transparent and monitored by the Federal Ministry for the Environment through environmental verifiers who are specifically accredited or licensed for EMAS,
- detailed information made available to the public through the validated environmental statement,
- validated legal compliance as a precondition of participation,
- publically accessible register of EMAS Participants.

### 3 Development of EMAS

From the beginning in 1993, like many other systems, EMAS passed a big transformation (Figure 1). The first EMAS Regulation (EMAS I) was adopted in 1993 and became operational in 1995 (EMAS I: Council Regulation (EEC) No 1836/93). It was originally restricted to companies in industrial sectors. Regulation establishes a voluntary participation in environmental management, based on harmonized positions of the European Association for the industrial companies from the EU and associated countries.

In 1992, the British Standards Institute published the first national standard BS 7750 in the field of supply environment. Prior to this, BSI also issued BS 5750, which is significantly contribute to the development of ISO 9000th ISO 14001 principally based on BS 7750, so both standards share many common requirements. BS is considered a much more demanding, since the company is planning to environmental accounting, that is, keeping a register of significant environmental impacts, register fulfillment of all legal regulations and other requirements, but also calls for public access to environmental goals.

They also developed some other state standards supply environment in the European Union countries (Ireland, France, Spain, etc.), which do not always have the same requirements and have sometimes been contradictory. It became clear that due to international trade should create a uniform standard across the EU. It's like you update national standards, created EMAS.

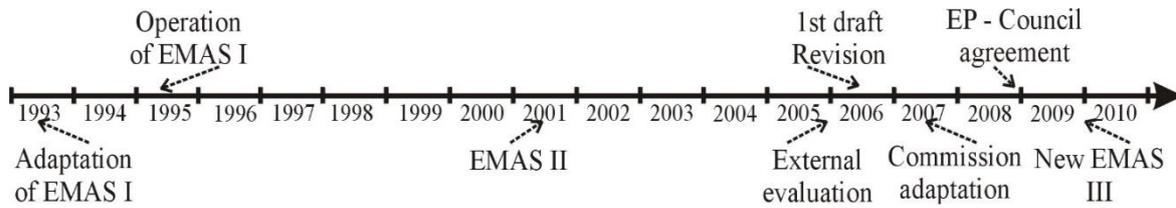
With the first revision of the EMAS Regulation in 2001 (EMAS II), the scheme opened to all economic sectors including public and private services (EMAS II: Regulation (EC) No 761/2001). In addition, EMAS II was strengthened by the integration of the environmental management requirements of ISO 14001; by adopting a new EMAS logo to signal engagement to stakeholders; and by considering more strongly indirect effects such as those related to financial services or administrative and planning decisions.

Principal elements of EMAS-2 are:

- Expansion of the system to the remaining economic areas,
- Integration of ISO 14001 as an environmental management system in the context of EMAS,
- Introduction distinguishing feature of the system, which will be registered organizations and their participation in EMAS fully promote more effectively,
- Participation of officials of companies to implement EMAS and enhance the role of environmental statements in order to improve the links between registered companies and their shareholders and the public.

The latest revision of EMAS came into effect on 11 January 2010 (EMAS III). With the introduction of EMAS III, the scheme is globally applicable and no longer limited to EU Member States. With EMAS III the EU also introduced obligatory Key Performance Indicators (KPI) in order to harmonize reporting on environmental performance. The number of EMAS registered organisations increased from 2,140 in 1997 to 4,659 in 2011.

Figure 21: Timing (The Big EMAS Revision)



#### 4 EMAS III

The regulation EMAS III introduces many new definitions, for example (Regulation (EC) No 1221/2009 Of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS)), which strengthen the scheme and add value to registered organisation.

The definitions are following:

- Best environmental management practice' means the most effective way to implement the environmental management system by organisations in a relevant sector and that can result in best environmental performance under given economic and technical conditions.
- Substantial change means any change in an organisation's operation, structure, administration, processes, activities, products or services that has or can have a significant impact on an organisation's environmental management system, the environment or human health.
- Cluster means a group of independent organisations related to each other by geographical proximity or business activities jointly implementing the environmental management system.
- Corporate registration means a single registration of all or some sites of an organisation with sites located in one or more Member States or third countries.
- Environmental performance indicator means a specific expression that allows measurement of an organisation's environmental performance.

Small organisations mean:

micro, small and medium-sized enterprises as defined in Commission Recommendation 2003/361/EC or

local authorities governing less than 10 000 inhabitants or other public authorities employing fewer than 250 persons and having an annual budget not exceeding EUR 50 million, or an annual balance sheet not exceeding EUR 43 million.

*New regulation EMAS III consists of:*

*9 chapters,*

*52 articles,*

*8 annexes.*

New elements introduced in the regulation EMAS III are following ([http://ec.europa.eu/environment/emas/about/summary\\_en.htm](http://ec.europa.eu/environment/emas/about/summary_en.htm)):

- Improvement of the applicability and credibility of the scheme:
- Transitional registration procedures to facilitate the introduction of EMAS III,
- Revised audit cycles to further improve applicability for SMEs,
- Single corporate registration to ease administrative and financial burdens on organisations with several sites,
- Cluster approach to provide specific assistance to clusters of organisations in the development and implementation phases of EMAS registration,
- Environmental core indicators help to adequately document environmental performance and create multi-annual comparability within and between organisations,
- Sectoral reference documents to facilitate the practical implementation 'on the ground' of EMAS requirements,
- Assistance from Member States to organisations on compliance with legal requirements relating to the environment to ease EMAS registration for organisations
- Enhanced legal compliance to further strengthen the credibility of the scheme
- (II) Strengthening EMAS' visibility and outreach:
- Single EMAS logo to communicate EMAS in one coherent and distinctive way
- EMAS Global to encourage the global uptake of the scheme by making EMAS certification possible for organisations and sites located outside the EU Community,
- Informational and promotional activities of EU Member States and European Commission to support EMAS III
- Recognition of other EMS to facilitate upgrade from existing EMS to EMAS.

Both in the environmental statement, as well as updated environmental statement, the organizations report key indicators in the extent that they are directly connected to environmental aspects and other relevant existing environmental performance indicators. Key indicators shall be applied in all types of organizations. There are six environmental core indicators (Table 1). Indicators are included in the environment statement and help adequately measure and monitor performance.

*Table 12: Six environmental core indicators (Premium Environmental Management)*

|                        |  |
|------------------------|--|
| Environmental key area |  |
|                        | Total direct energy use: total annual energy consumption, expressed in MWh or GJ |

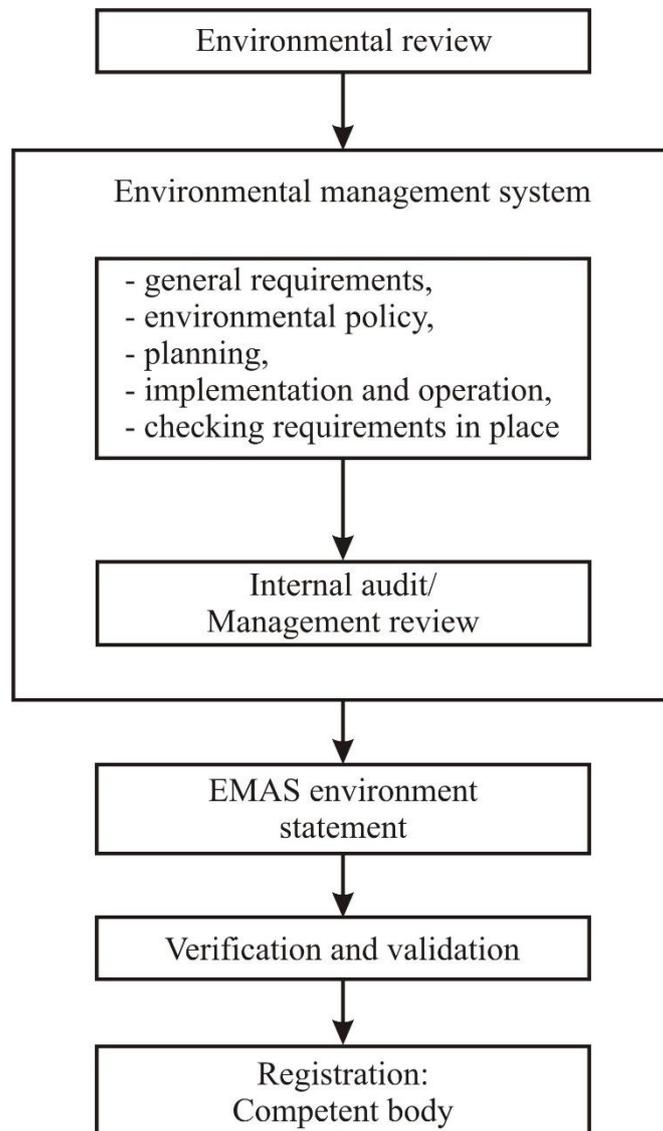
## 5 Main steps of EMAS implementation

To receive EMAS registration an organisation must comply with the following steps ([http://ec.europa.eu/environment/emas/about/summary\\_en.htm](http://ec.europa.eu/environment/emas/about/summary_en.htm)):

- Conduct an environmental review considering all environmental aspects of the organisation's activities, products and services, methods to assess these, relevant legal and regulatory framework and existing environmental management practices and procedures.
- Adopt environmental policy containing commitment both to comply with all relevant environmental legislation and to achieve continuous improvements in environmental performance.
- Develop an environmental programme that contains information on specific environmental objectives and targets. The environmental programme is a tool to help the organisation in its everyday work when planning and implementing the improvements.
- Based on the results of the review, establish an effective environmental management system (EMS) aimed at achieving the organisation's environmental policy and at improving the environmental performance continually. The management system needs to set responsibilities, means to achieve objectives, operational procedures, training needs, monitoring and communication systems.
- Carry out an environmental audit assessing in particular the management system in place and conformity with the organisation's policy and programme as well as compliance with relevant environmental regulatory requirements.
- Provide an environmental statement of its environmental performance which lays down the results achieved against the environmental objectives and the future steps to be undertaken in order to continuously improve the organisation's environmental performance.
- The environmental review, EMS, audit procedure and the environmental statement must be approved by an accredited environmental verifier. The validated statement needs to be sent to the EMAS Competent Body for registration and made publicly available before an organisation can use the EMAS logo.

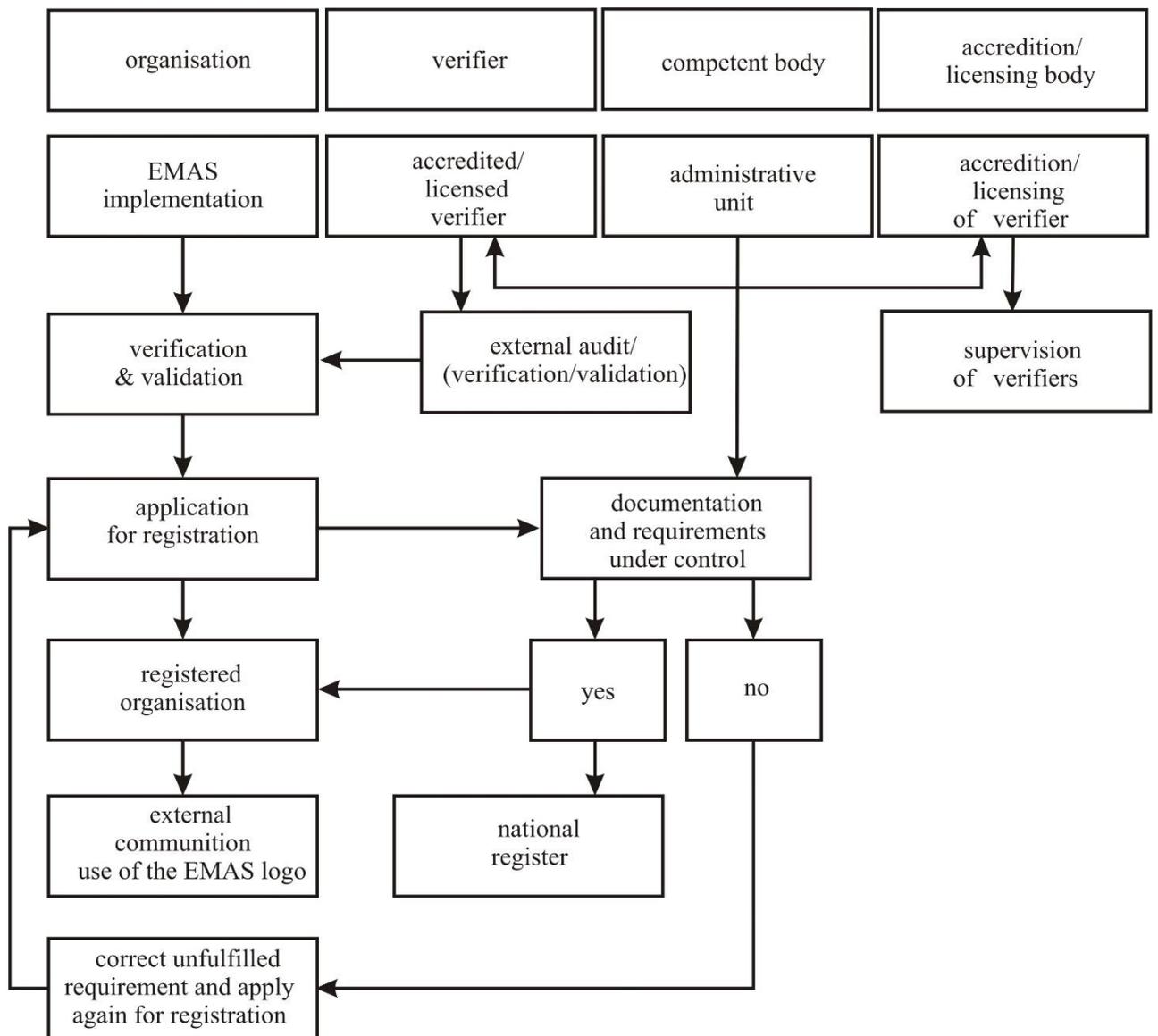
(Commission Decision establishing the user's guide setting out the steps needed to participate in EMAS) presents general schedule how to implement EMAS (Figure 2).

Figure 22: General schedule for EMAS implementation (Commission Decision establishing the user's guide setting out the steps needed to participate in EMAS)



The Registration procedure of EMAS is presented in Figure 3.

Figure 23: EMAS pillar. Registration procedure (Commission Decision establishing the user's guide setting out the steps needed to participate in EMAS)



## 6 Benefits and barriers of EMAS

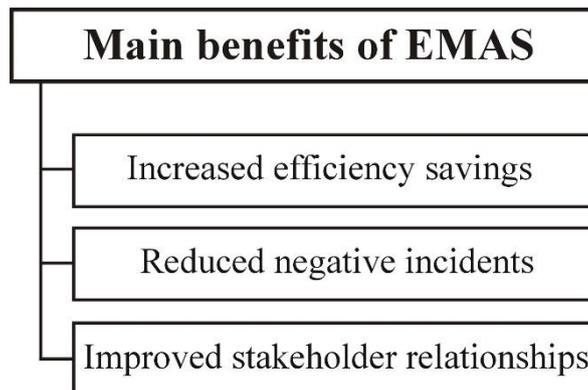
EMAS registration has many benefits. There are three the most commonly identified benefits in the available literature (shown also as Figure 4) (EMAS – Factsheet. EMAS benefits. 2011):

Increased efficiency savings: The primary benefit of EMAS registration is costs savings through increased resource efficiency. EMAS helps registered organisations identify opportunities to better manage their resources.

Reduced negative incidents: EMAS provides organisations with a better overview of their processes and greater control, which allows organizations to reduce the number of negative incidents.

Improved stakeholder relationships: Improved relations with regulators, non-governmental organisations (NGOs) and the local community increases trust and understanding between parties, thereby reducing the number of complaints received from stakeholders.

Figure 24: EMAS pillar. Registration procedure (own study based on EMAS – Factsheet. EMAS benefits. 2011)



European Commission divided all benefits into 4 main groups ([http://ec.europa.eu/environment/emas/about/summary\\_en.htm](http://ec.europa.eu/environment/emas/about/summary_en.htm)):

- Enhanced environmental and financial performance:
  - high quality environmental management,
  - resource efficiency and lower costs,
- Enhanced risk and opportunity management:
  - guarantee of full regulatory compliance with environmental legislation,
  - reduced risk of fines related to environmental legislation,
  - regulatory relief,
  - access to deregulation incentives,
  - access to public contracts,
- Enhanced credibility, transparency and reputation:
  - continuous improvement of environmental performance is verified,
  - independently validated environmental information,
  - use of the EMAS logo as a marketing tool,
  - increased business opportunities in markets where green production processes are important,
  - better relations with customers, the local and wider community, and regulators,
- Enhanced employee empowerment and motivation:
  - improved workplace environment,
  - enhanced employee commitment,
  - greater team-building capacity.

Barriers to EMAS registration are generally categorised into those that are external to the organisation, and those that are internal. In Table 2 there is summary of key barriers.

*Table 13: Key barriers of EMAS registration (Study on the Costs and Benefits of EMAS to Registered Organisations. Final Report. 2009)*

|   |
|---|
| External barrier  |
| Cost of registration  |
| Lack of support and guidance from Member State Competent Bodies   |
| Hindrances linked to the institutional framework  |
| Lack of market recognition of the EMAS logo   |
| Lack of customer interest and awareness regarding EMAS  |
| Lack of feedback following registration   |
| Lack of recognition and positive rewards by public institutions   |
| Internal Barriers   |
| Lack of financial resources/ Budget constraints   |
| Difficulties in the understanding and perception of the EMAS scheme   |
| Organisational culture  |
| Lack of human resources and competence  |
| Difficulties in involving and motivating the internal personnel   |
| Dominance of foreign consultancies in delivering consultation and auditing services to support registration, associated high prices, and the need for translation |
| Lack of political support (public authorities)  |
| On-going commitment and difficulties in understanding and implementing the EMAS requirements (public authorities)   |

## **7 Conclusion**

Summin up, what EMAS is, it is environmental management instrument, which help an organisation to assess, manage and continuously improve their environmental performance. It introduced six environmental core indicators which can show the impact of the organisation on the environment. Being Eco it is very fashionable, even if it comes to te organisations. So if we don't know how to operate in proper, environmental way, we can use EMAS as a guide of the environemtal management system.

# Quality standards

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## 1 Introduction

On today's international markets works strong competition. For this reason, the company, regardless of its size, must look for ways to create new activities, preserving existing as well as make them more efficient and effective. Implementation of quality management systems is becoming increasingly popular and effective way of achieving these objectives.

***Companies come to the conclusion that quality systems not only improve overall profitability, but much strengthen their position in the market and increase the trust of customers. The development and effective implementation of the quality system is dependent on the size of the company and employee engagement. Can mean huge and long-term benefits for business and customers.***

## 2 ISO 9000 “Quality management”

The ISO 9000 family addresses various aspects of quality management and contains some of ISO's best known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved.

Standards in the ISO 9000 family include ([www.iso.org/iso/home/standards/management-standards/iso\\_9000.htm](http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm)):

- ISO 9001:2008 - sets out the requirements of a quality management system
- ISO 9000:2005 - covers the basic concepts and language
- ISO 9004:2009 - focuses on how to make a quality management system more efficient and effective
- ISO 19011:2011 - sets out guidance on internal and external audits of quality management systems.

***What ISO 9000 exactly is:***

***Quality is something every company strives for and is often times very difficult to achieve. Complications concerning efficiency and quality present themselves every day in business, whether an important document cannot be found or a consumer finds a product not up to their expectations. How can a company increase the quality of its products and services?  
The answer is ISO 9000***

As standards go, ISO 9000 is one of the most widely recognized in the world. ISO 9000 is a quality management standard that presents guidelines intended to increase business efficiency and customer satisfaction. The goal of ISO 9000 is to embed a quality management system within an organization, increasing productivity, reducing unnecessary costs, and ensuring quality of processes and products.

ISO 9001:2008 is applicable to businesses and organizations from every sector. The process oriented approach makes the standard applicable to service organizations as well. Its general guidelines allow for the flexibility needed for today's diverse business world.

Before ISO 9000 is a set of five International Standards for Quality Assurance (Bureau of Business Practice):

- ISO 9000 contains guidelines for the other four standards.
- ISO 9001 is intended for suppliers who do a lot of design or customization.
- ISO 9002 involves standards for both production and installation.
- ISO 9003 is guidelines for final test and inspection.
- ISO 9004 is designed to help managers develop a substantial quality system

The ISO 9000 standards are not rules, but merely a set of guidelines that organize their processes and make it more cost effective ([www.isoeasy.org](http://www.isoeasy.org))

### ***How ISO 9000 works?***

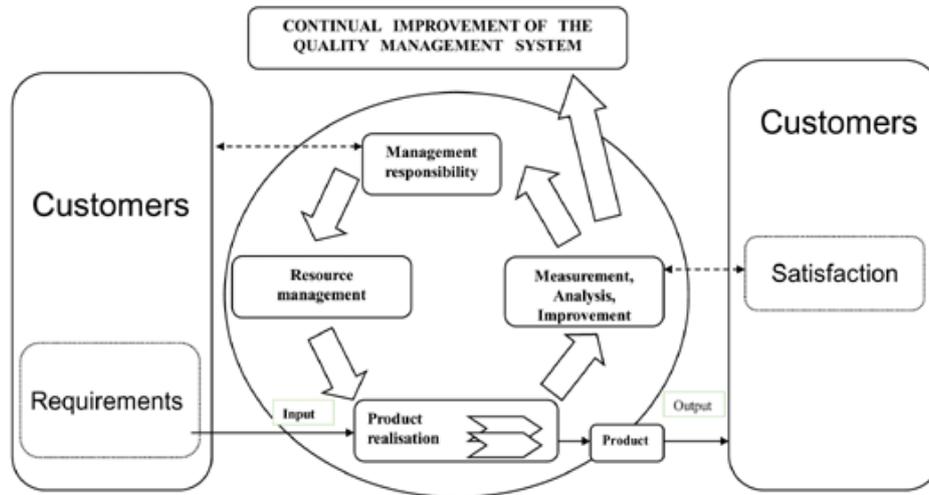
ISO 9000 is set up as a collection of guidelines that help a company establish, maintain, and improve a quality management system. It is important to stress that ISO 9000 is not a rigid set of requirements, and that organizations have flexibility in how they implement their quality management system. This freedom allows the ISO 9000 standard to be used in a wide range of organizations, and in businesses large and small.

One important aspect of ISO 9000 is its process-oriented approach. Instead of looking at a company's departments and individual processes, ISO 9000 requires that a company look at "the big picture." How do processes interact? Can they be integrated with one another? What are the important aspects of products and services?

Once this process-oriented approach is implemented, various audits can be done as a check of the effectiveness of your quality management system. There are three main types of audits – 1st, 2nd, and 3rd party audits. An internal audit is a 1st party audit. ISO 9000 encourages (and requires) this type of audit so that an organization can get feedback quickly from those who know the company best. However, this audit process cannot be viewed as impartial. Therefore, 2nd party audits allow for a consumer to evaluate the performance on an organization. As an alternative to a 2nd party audit, many companies choose to become certified with ISO 9000 through a 3rd party audit. In this case, an independent certification body comes into an organization and evaluates it in terms of the ISO 9000 guidelines. If an organization meets the requirements of the standard, it becomes certified in ISO 9000 and carries a seal of quality recognized throughout the world.

ISO 9000 is based on PDCA (Deming cycle). Its model is presented in Figure 1.

Figure 25: Quality management process model



Source: ISO 9001:2008 - Quality management systems – Requirements

The model approaches the Quality Management System with both vertical and horizontal process integration. The vertical addresses the Quality Management System requirements; the horizontal begins and ends with the customer.

Customer interaction is a key component to the input and output of this process model. Customers identify needs and requirements at the beginning, and provide feedback to the organization at the end. With the customer becoming more integral in the activities of the organization, continual improvement and customer satisfaction become part of the closure process.

Further, both vertical and horizontal processes share measurement, analysis and improvement requirements which will serve in the feedback loop for retrieving information from the customer as well as better understanding the levels of success of internal activities relative to the organization.

Lastly, the process model introduces the Plan-Do-Check-Act cycle philosophy and disciplines within the vertical (internal) loop where measurement requirements lead back to Management Responsibility. Essentially, this cycle completes an integral component of this model and sets the mandate that an organization establish baseline measurable targets for its processes, seek to understand its processes, then improve its processes.

In development of business management systems companies may effectively demonstrate and document key business processes from customer input to company deliverables, with interfaces between inputs, outputs, inter-related processes through process planning. This can involve extensive complicated, complex process plans or simple flow plans based on the type of organization. The plans can be an integral part of the Quality Management Systems for management control of the business.

**What ISO 9000 gives to us?**

Often companies become ISO certified because customers require it. For example, a lot of customers in Europe demand ISO 9000 approval. Where some companies miss out is when they only get ISO 9000 certified for marketing reasons. The ISO 9000 standards improve operating

procedure and reduce cost. Being ISO certified means that companies operate using the ISO guideline. When companies advertise the fact that they are ISO certified, it has been proven to be a very powerful marketing tool for them. When customers know that their product is ISO 9000 certified they feel assured that their product is what they expect.

These stamp of ISO 9000 approval, lets customers know what to expect, thus they get a quality product. The standards set by ISO 9000 insure a dependable Quality Assurance system. Additionally, any company that does business in Europe knows that customers are demanding products be ISO 9000 certified.

As worldwide customers demand ISO 9000 standards, ISO 9000 will become more prevalent. As more international companies come into the market, this will make companies more competitive. The increase in competition will improve the quality and decrease cost of the product, thus creating a better environment for the consumer.

### 3 Importance of ISO 9000

***The importance of ISO 9000 is the importance of quality. Many companies offer products and services, but it is those companies who put out the best products and services efficiently that succeed. With ISO 9000, an organization can identify the root of the problem, and therefore find a solution. By improving efficiency, profit can be maximized.***

As a broad range of companies implement the ISO 9000 standards, a supply chain with integrity is created. Each company that participates in the process of developing, manufacturing, and marketing a product knows that it is part of an internationally known, reliable system.

Not only do businesses recognize the importance of the ISO 9000, but also the customer realizes the importance of quality. And because the consumer is most important to a company, ISO 9000 makes the customer its focus.

*Table 14: ISO 9000 Principles*

|                         |  |
|-------------------------|--|
| <b>A Customer Focus</b> | As stated before, the customer is the primary focus of a business. By understanding and responding to the needs of customers, an organization can correctly target key demographics and therefore increase revenue by delivering the products and services that the customer is looking for. With knowledge of customer needs, resources can be allocated appropriately and efficiently. Most importantly, a business's dedication will be recognized by the customer, creating customer loyalty. And customer loyalty is return business. |
| Good Leadership         | A team of good leaders will establish unity and direction quickly in a business environment. Their goal is to motivate everyone working on the project, and successful leaders will minimize miscommunication within and between departments. Their role is intimately intertwined with the next ISO 9000 principle.   |
| Involvement of people   | The inclusion of everyone on a business team is critical to its success. Involvement of substance will lead to a personal investment in a project and in turn create motivated, committed workers. These people will tend towards  |

|  |  |
|--|--|
|  | innovation and creativity, and utilize their full abilities to complete a project. If people have a vested interest in performance, they will be eager to participate in the continual improvement that ISO 900 facilitates.   |
| Process approach to quality management | The best results are achieved when activities and resources are managed together. This process approach to quality management can lower costs through the effective use of resources, personnel, and time. If a process is controlled as a whole, management can focus on goals that are important to the big picture, and prioritize objectives to maximize effectiveness.  |
| Management system approach             | Combining management groups may seem like a dangerous clash of titans, but if done correctly can result in an efficient and effective management system. If leaders are dedicated to the goals of an organization, they will aid each other to achieve improved productivity. Some results include integration and alignment of key processes. Additionally, interested parties will recognize the consistency, effectiveness, and efficiency that come with a management system. Both suppliers and customers will gain confidence in a business's abilities. |
| Continual Improvement                  | The importance of this principle is paramount, and should a permanent objective of every organization. Through increased performance, a company can increase profits and gain an advantage over competitors. If a whole business is dedicated to continual improvement, improvement activities will be aligned, leading to faster and more efficient development. Ready for improvement and change, businesses will have the flexibility to react quickly to new opportunities.  |
| Factual approach to decision making    | Effective decisions are based on the analysis and interpretation of information and data. By making informed decisions, an organization will be more likely to make the right decision. As companies make this a habit, they will be able to demonstrate the effectiveness of past decisions. This will put confidence in current and future decisions.  |
| Supplier relationships                 | It is important to establish a mutually beneficial supplier relationship; such a relationship creates value for both parties. A supplier that recognizes a mutually beneficial relationship will be quick to react when a business needs to respond to customer needs or market changes. Through close contact and interaction with a supplier, both organizations will be able to optimize resources and costs.   |

#### **4 Importance of root cause analysis and systemic corrective action in management system standards**

When problem solving, it is important to find the cause of problem in order to develop a solution. Sometimes, the most obvious cause is not the right one. This is why ISO 9000 stresses the importance of finding the root cause(s) of a problem. There may be multiple, subtle reasons why a process isn't working correctly, and finding the actual causes will lead a company one step closer to a solution and implementation of corrective actions.

The goal of finding root causes is to improve the way problems are managed. Becoming adept in recognizing the root causes of a problem will lead to a reduced impact, a containment of error, and the prevention of recurrence. Identifying and correcting root causes will also lead to the reduction of unnecessary efforts which in turn will lower the cost of maintaining quality. As more

and more corrective actions are taken, processes will become more stable, and continual improvement will face less interruptions.

## **5 Interaction of ISO 9000 with other standards**

ISO 9000 is the standard for a quality management system that closely resembles many other management systems. These other systems, based on health, safety, the environment, and business continuity, can be integrated into an overarching business management system. Benefits of this system include aligned interests, reduced costs, and improved efficiency. With one of these systems in place, it is easier to implement any of the others; many documents required for a different standard are already prepared, and personnel are already accustomed to the audit process. Using multiple standards will not only increase the efficiency of an organization, but increase the integrity of its operations.

### ***Significance of the ISO 9000 for the company***

ISO 9000 is a standard created to make the attainment of quality, consistent products easier by providing specific steps for development of an organization's quality management system. This quality management system is meant to monitor the progress of a product or service as it goes through each stage of production, from development to testing to assembly to customer feedback.

One cornerstone of ISO 9000 is continual improvement. No company should ever be satisfied with the conditions of a process at the given moment; they should always be looking for ways to make these processes more efficient and effective. ISO 9000 was written with the business world's insatiable desire for excellence in mind. This is why continual improvement is a requirement of the standard – to inspire progress and the pursuit of perfection.

ISO 9000 is an internationally recognized standard, and that may seem daunting for some smaller businesses. How are they going to implement the same standard adopted by multi-national corporations? Quite easily, actually. ISO 9000 is a flexible standard that lays down requirements for an organization to follow, but allows the organization to fulfil these requirements any way they choose. This increases ISO 9000's scope of effectiveness, allowing a wide range of companies to create quality management systems that match their needs.

ISO 9000 is seen in every sector of the business world, and its success is a testament to its worth. With a focus on customer satisfaction, products and services improve and flourish under ISO 9000's quality management system. With a combination of continual improvement and corrective actions – tenets of ISO 9000 – a business will create processes that run smoothly and efficiently.

## **7 The ISO 9000 QMS Design Context**

The process used to create an effective QMS based on the ISO 9001:2000 International Standard extends directly to the creation of any QMS based on a standard.

By a standard, we mean a document published by either a national or international organization that has achieved a relatively high level of industry recognition and credibility in its specific area of expertise. There are of course ad hoc standards that are created and distributed within

specific technical fields. Such ad hoc standards are extremely useful but are generally not recognized at so high a national or international level.

Examples of widely recognized national and international standards include QS-9000 for the automotive industry; AS9100 and IAQS 9100:2000 for aerospace; the Baldrige National Quality Program for total quality management; TL 9000 for telecommunications; and the FDA/CGMP 820, EN46001, and ISO 13485 standards for medical devices.

In many cases, a specific standard is complemented by a series of additional mandatory standards. For medical companies that wish to deliver product into countries that require a product certification (CE mark), it is necessary to comply with the Medical Device Directive 93/43/EEC. Health Canada provides its own Medical Devices Regulations that require specific licensing. In addition, the ISO 14000 standard is used for environmental management systems. QMS mastery is a journey not a destination.

There are literally thousands of standards and supplemental guidelines in use throughout the world. However, no matter how complex the set of standards, the underlying process to create an effective QMS is the same. The mastery of this process is no different than the mastery of any technical regimen ([vietnamwcm.files.wordpress.com/2008/07/iso-9001-2000-quality-management-system-design.pdf](http://vietnamwcm.files.wordpress.com/2008/07/iso-9001-2000-quality-management-system-design.pdf)).

## **8 Advantages and disadvantages to having a quality system**

In 1987, an ISO committee chaired by Canada, worked to produce an international quality standard. Inputs from many nations were considered and they produced a standard based on the then British Standard BS 5750 which was the first of the ISO 9000 series of standards. Since 1987 the ISO 9000 family of standards has grown and includes associated guidelines applicable to particular industries. At this time there is no guide available specific to the delivery NMHSs products and services.

ISO has two kinds of quality management standards: requirements and guidelines and together they make up what is known as the ISO 9000 family of standards. There are three standards in the ISO 9000 family of Standards and they represent an international consensus on good quality management practices ([http://www.wmo.int/pages/prog/amp/aemp/documents/QM\\_Guide\\_NMHSs\\_V10.pdf](http://www.wmo.int/pages/prog/amp/aemp/documents/QM_Guide_NMHSs_V10.pdf)):

- *ISO 9000:2005 - Quality management systems - fundamentals and vocabulary (ISO 9000)*: Describes fundamentals of quality management systems and specifies the terminology for quality management systems.
- *ISO 9001:2008 - Quality management systems - requirements (ISO 9001)*: These requirements can be applied to all types of organizations both public and private sector, regardless of size or industry group. It can help both product and service organizations achieve standards of quality that are internationally recognized and respected throughout the world. It is the only standard in the family against which organizations can be certified (or registered) by a third party audit process.
- *ISO 9004:2009 - Managing for the sustained success of an organization - a quality management approach (ISO 9004)*: Provides guidance to support the achievement of sustained success in today's complex, demanding, and ever-changing environment. It focuses on achieving sustainable success by meeting the needs and expectations of its customers and other stakeholders. An interesting facet of this standard is that it promotes self-assessment as an important tool that enables ongoing review of the

maturity level of the QMS. However, it should be noted that the self-assessment tool is not a substitute for a third party audit process that is applicable to ISO 9001.

*Table 15: Benefits of having a Quality Management System*

|  |
|--|
| <p><b>Increased Efficiency</b><br/>Companies going through the ISO 9001:2008 <b>Quality Management System certification</b> process are aiming to maximize the quality and efficiency of their processes. Once you are certified for <b>Quality Management System</b>, guidelines are put in place that can be followed easily by all your employees. Factors within the company such as trouble-shooting, transitions, and training are also dealt with easier.</p>             |
| <p>Companies which are ISO <b>Quality Management System certified</b> experiences improved financial performance and increased productivity when compared to uncertified companies.</p>  |
| <p>There are some factors in your company that plays a role in motivating and satisfying your staff. These include accountability of management, having clearly defined roles and responsibilities, establishing training systems, as well as painting a clear picture of how their roles not only affect the quality, but also the overall success of the company.</p>  |
| <p>ISO (International Organization for Standardization) is recognized worldwide as the authority on quality management.</p>  |
| <p><b>Factual Approach to Decision Making</b><br/>The ISO 9001: 2008 <b>Quality Management System</b> standard comes with a set of clear instructions regarding process reviews and audits. These instructions facilitate decision making and information gathering based on the data.</p>   |
| <p><b>Improves Supplier Relationships</b><br/>One of the key attractions to ISO certification is the mutually beneficial supplier relationships. In order to ensure that quality raw materials go into your production system, the processes concerning documentation and testing should be followed carefully. Thorough evaluation of new suppliers before changes are made is also part of the process.</p>  |
| <p><b>Effective and Structured Documentation</b><br/>Documentation of all processes, as well as any discrepancies, errors, and changes is an important requirement of the ISO <b>Quality Management System</b> standard. Accountability of all staff and consistency throughout production are hereby ensured. Traceable records are thus also available in cases of raw materials and non-compliant products.</p>   |
| <p><b>Consistency within all Processes of your Company</b><br/>Consistency is one of the foundations on which ISO is build. All processes operating within a business, from the research and development stage, to production and ultimately shipping, are defined, outlined, and documented. This consistency minimises the room for error. Even the process of making changes is well planned and implemented; it is done in the best possible way to maximise efficiency.</p> |
| <p><b>Building Customer Satisfaction</b><br/>The universal acceptance of the ISO standards is responsible for building client confidence. Customer satisfaction is ensured through the benefits ISO 9001:2000 Quality Management System holds for company efficiency, consistency, and dedication to quality service.</p>  |
| <p><b>Improvement Processes based on Facts</b><br/>Audit processes, management review, and improvement processes based on collected data are outlined by ISO 9001:2008 Quality Management System. Improvements based on facts are carefully planned and implemented; this is done through the use of a system of documentation and analysis. This in turn will ensure the best decisions for your company are made.</p>  |

*Source: <http://www.qualicertus.co.za/benefitsofqualitymanagementsystem.html>*

A good foundation builds a good business, and ISO 9000 is a good foundation for small businesses that want to expand their market. By introducing a quality management system like ISO 9000 to a small and big business, the quality of processes will increase and costs due to inefficiency will decrease. In addition, a small business will be able to advertise their use of the internationally recognized ISO 9000. This may create business opportunities that were not available before an objectively verified quality management system was in place.

Having management systems in place, such as ISO 9000, will also help when selling a business. The integrity and value of a small business will be apparent with well-documented processes and proof of quality. ISO 9000 will ensure the reputation of your business in any situation ([www.pjr.com/standards/iso-90012008/benefits-of-iso-9000](http://www.pjr.com/standards/iso-90012008/benefits-of-iso-9000)).

Companies strive for a total quality system because quality is what the customer demands. There are other reasons why a company may seek a quality system ([www.public.iastate.edu/~vardeman/IE361/f00mini/de-almeida-gunaman-nurre.pdf](http://www.public.iastate.edu/~vardeman/IE361/f00mini/de-almeida-gunaman-nurre.pdf)):

- Ensure that products and services provided meet customer requirements.
- Ensure consistency in the day to day operations.
- Ensure that processes are repeatable and predictable.
- Allow the company to create and retain satisfied customers
- Improve the efficiency, reduce operating cost and minimize unproductive time.

All of these features are important in having a competitive company. ISO 9000 is not just a badge to be worn, it is a set of standards to be followed. It is quickly sweeping the world as an international standard. Those companies who ignore ISO 9000 will be left behind. The advantages far out weight the disadvantages, if a company follows the ISO 9000 guidelines strictly. So what does it mean to be ISO 9000 certified? It means following the ISO 9000 guidelines to build a competitive company in a global economy.

Many companies are ISO 9000, but there are some companies that choose not to be certified. As previously stated, ISO 9000 is a stead of guidelines. These guidelines are implemented into companies' operations. However, there are reasons why companies would not be ISO.

*Table 16: Disadvantages of having a Quality Management System*

|  |
|--|
| <p>Owners and managers do not have an adequate understanding of the ISO 9000 certification process or of the quality standards themselves—Some business owners have been known to direct their company's resources toward ISO 9000 registration, only to find that their incomplete understanding of the process and its requirements results in wasted time and effort.</p>   |
| <p>Heavy emphasis on documentation—The ISO 9000 certification process relies heavily on documentation of internal operating procedures in many areas, and as Meyer stated, "many say ISO's exacting documentation requirements gobble up time. Indeed, there are horror stories about companies losing substantial business because a documentation obsession redirected their priorities." According to Nation's Business, small business owners need to find an appropriate balance between ISO documentation requirements, which are admittedly "one is ISO 9000's hallmarks, " and attending to the fundamental business of running a company: "Strike a balance among obsessively writing down every employee's task, offering training for the work, and letting common sense dictate how a task is to be performed.</p> |
| <p>Strength of the process—Business executives and owners familiar with the ISO 9000 registration process warn that it is a process that takes many months to complete. The 1996</p>   |

Quality Systems Update survey indicated that it took businesses an average of 15 months to move from the early stages of the process to passage of the final audit, and that processes of 18-20 months or even longer were not that uncommon.

Source: <http://www.referenceforbusiness.com/small/Inc-Mail/ISO-9000.html>

Even though there may be an initial implementing cost, ISO 9000 has been proven to reduce cost and improve the total quality in the long run. The implementation of ISO 9000 benefits far outweighs any disadvantages.

## **9 Examples of ISO 9000 uses in Industry**

Measurement and calibration is one of the most important elements in quality assurance. ISO 9001-9003 lay down some procedures to be followed when selecting, using, calibrating, controlling, and maintaining measurement standards for measuring equipment. For instance, ISO specifies that each instrument must have a label to show calibration status, usage limits, and any instrument that has failed or suspected to be out of calibration. If an instrument fails this specification, it must be withdrawn from use and labelled conspicuously to prevent accidental use. The procedures in ISO 9001-9003 can be used to ensure the quality of their products. It also states that all calibration procedures must be documented, all personnel performing calibration function must have adequate training, and adjustable devices must be sealed to prevent tampering (Morris 9). These stated procedures are intended to prevent errors that are caused by operators. The procedures also improve the confidence level of the data. By improving the confidence level of the data, companies will be able to see when a problem appears in production within a short period of time. Fast response time to problems will equal more profit for the company.

### ***ISO 9001 "Quality Management System Requirements"***

**ISO 9001** is the title of a document (Standard) that outlines the requirements an organization must maintain in their quality system for ISO 9001 certification. There are several different documents in the ISO 9000 family of standards, but ISO 9001-2008 is the only ISO standard that requires certification. ISO 9001:2008 is the most recent standard, and the "2008" references the year of latest revision. It was previously called ISO 9001:2000, which is now obsolete (as are ISO 9002 and ISO 9003.) and replaced by ISO 9001:2008 in the year 2008.

Since the first release ISO 9001 over 30 years ago, by ISO (International Organization for Standardization), more than one million organizations worldwide have adopted the principles and achieved certification to the requirements of ISO 9001, Quality Management System.

Today's version provides organizations with a comprehensive process-focused framework upon which you can build business processes that lead to the successful achievement of organizational objectives.

### ***ISO 9001:2008 - world's leading Management System Standard***

Globally adopted in virtually all industries - from manufacturers and service companies, to companies both large and small, multi-site multi-national organizations and single location businesses, ISO 9001 has become the most widely recognized Management System Standard.

The principles, upon which ISO 9001:2008 is based, include (<http://www.saiglobal.com/training/assurance/quality-management/>):

- customer focus,

- leadership,
- involvement of people,
- process approach,
- system approach to management,
- continual improvement,
- factual approach to decision making,
- mutually beneficial supplier relationship.

The Standard's relevance and value is evidenced further by specific industries as it is the basis for multiple industry specific standards including AS 9100 for Aerospace, ISO 13485 for Medical Device, LAW 9000, Health 9000 and Financial Planning 9000 (<http://www.saiglobal.com/Assurance/quality-business-management/ISO9001.htm>).

As an **ISO 9001 certified** organisation you will have implemented quality management system requirements for all areas of the business including:

- facilities,
- people,
- training,
- services,
- equipment.

Achieving **ISO 9001 standards** is the first step of a process of continual improvement that will provide your organisation with the necessary management tools to improve working practices throughout the entire organisation.

### ***ISO 9001 Requirements in Plain English***

ISO 9001 outlines the requirements of the ISO 9000 Standard, but it isn't easy reading. Quality Management System must address each of these ISO requirements (<http://the9000store.com/>).

Figure 26: ISO 9001 Requirements

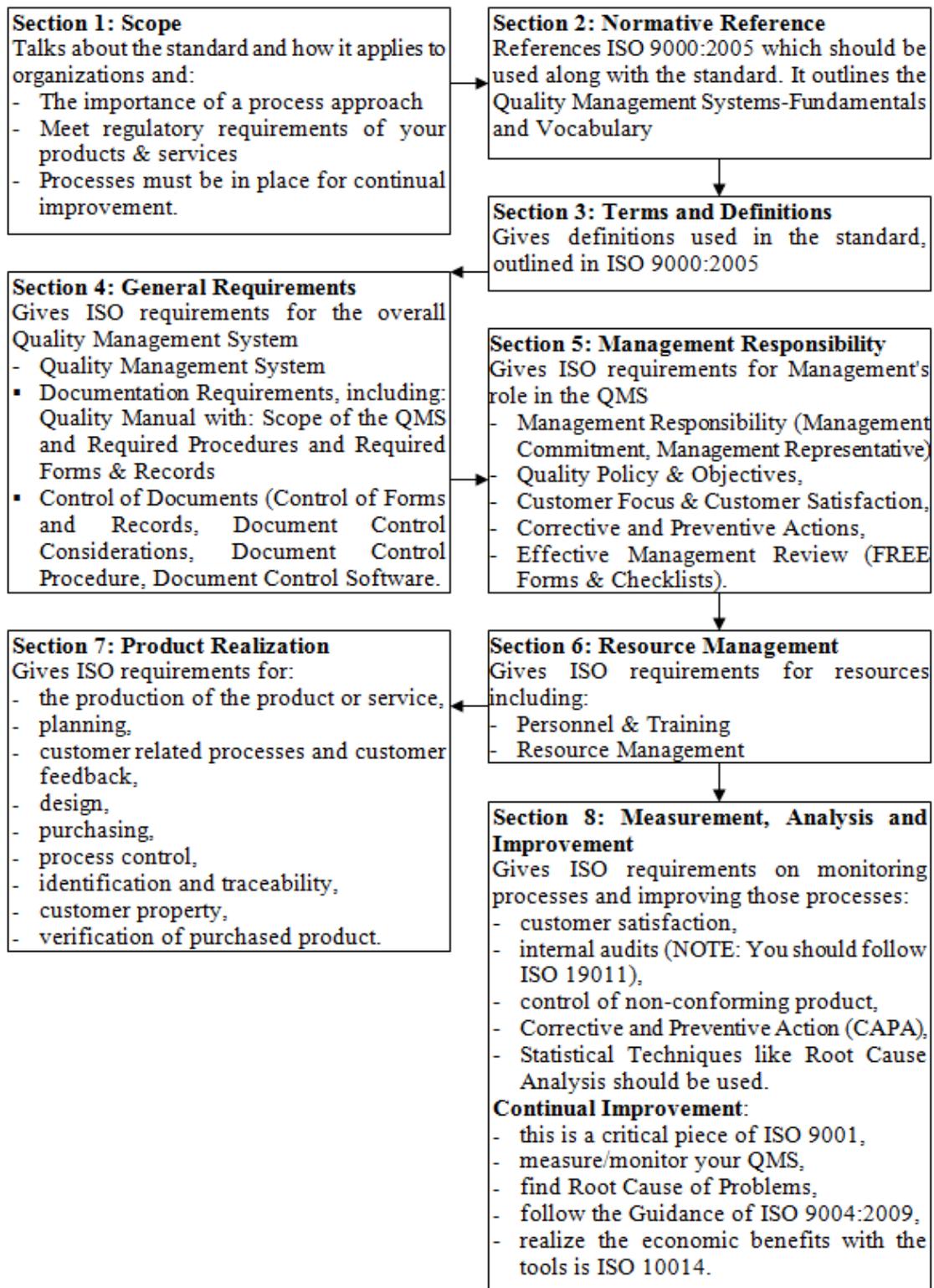
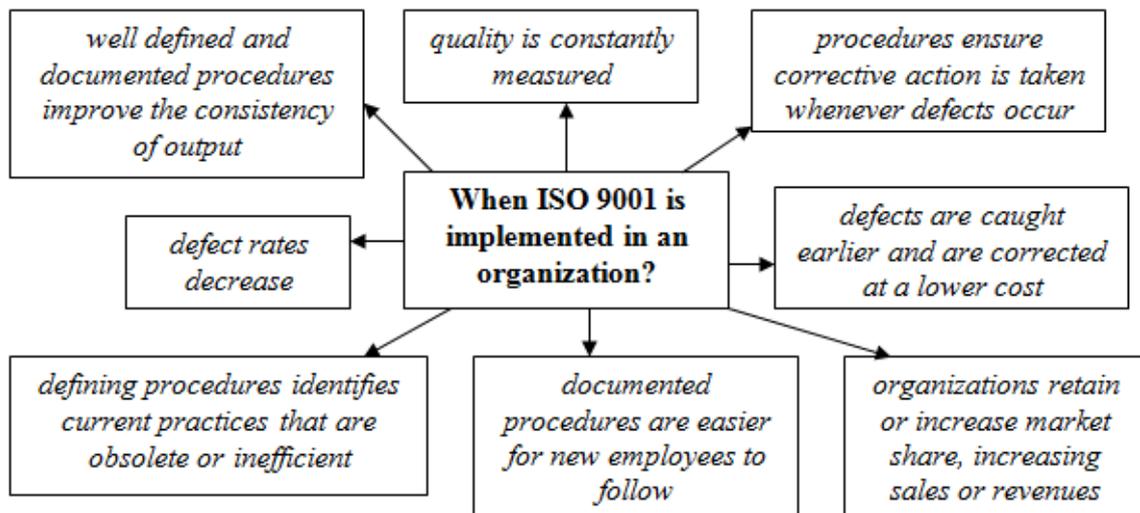


Figure 27: *When ISO 9001 is implemented in an organization?*



Source: <http://the9000store.com/>

Top reasons given for registration:

- internal operational efficiency,
- lower production costs because of fewer nonconforming products, less rework, lowered rejection rates, streamlined processes and fewer mistakes,
- access to new markets,
- some markets require ISO 9001 Registration, some markets favour companies with ISO 9000 Registration,
- customer request,
- many organizations are asked by a customer to obtain registration as a requirement to continue or to start doing business with them.

Despite your certification, if you don't follow the Eight Quality Management Principles (QMP's) your organization will not realize the benefits (<http://the9000store.com/>):

- Management must be committed to quality with the same rigor as other corporate objectives. **QMP 2.**
- Entire organization must be engaged as they would for safety or other goals. **QMP 3.**
- Execution comes from everyone, not just the Quality Department. **QMP 1, QMP 5.**
- Management must take ownership and cannot outsource this to a third party - they will now know the organization as well as your own team. **QMP 4, QMP 3.**
- You must audit and take corrective/preventive action for real improvement. **QMP 6, QMP 7.**

### **Benefits of ISO 9001**

An **ISO 9001 certificate** will provide maximum benefit to your organisation if it approaches **ISO 9001 implementation** in a practical way. This will ensure that the quality management systems that are adopted, work to improve the business and are not just a set of procedures that your employees will find hard to manage.

By adopting an approach that starts out to implement more **efficient working practices** and focuses on the business objectives of the organisation, you will achieve a system that will help and support your staff, and improve customer satisfaction.

Whether you use an external assessor or allocate an internal resource to carry out the initial assessments, you will need to ensure that they have buy-in from senior management so that all areas of the organisation are aware of the importance of the **ISO accreditation** process.

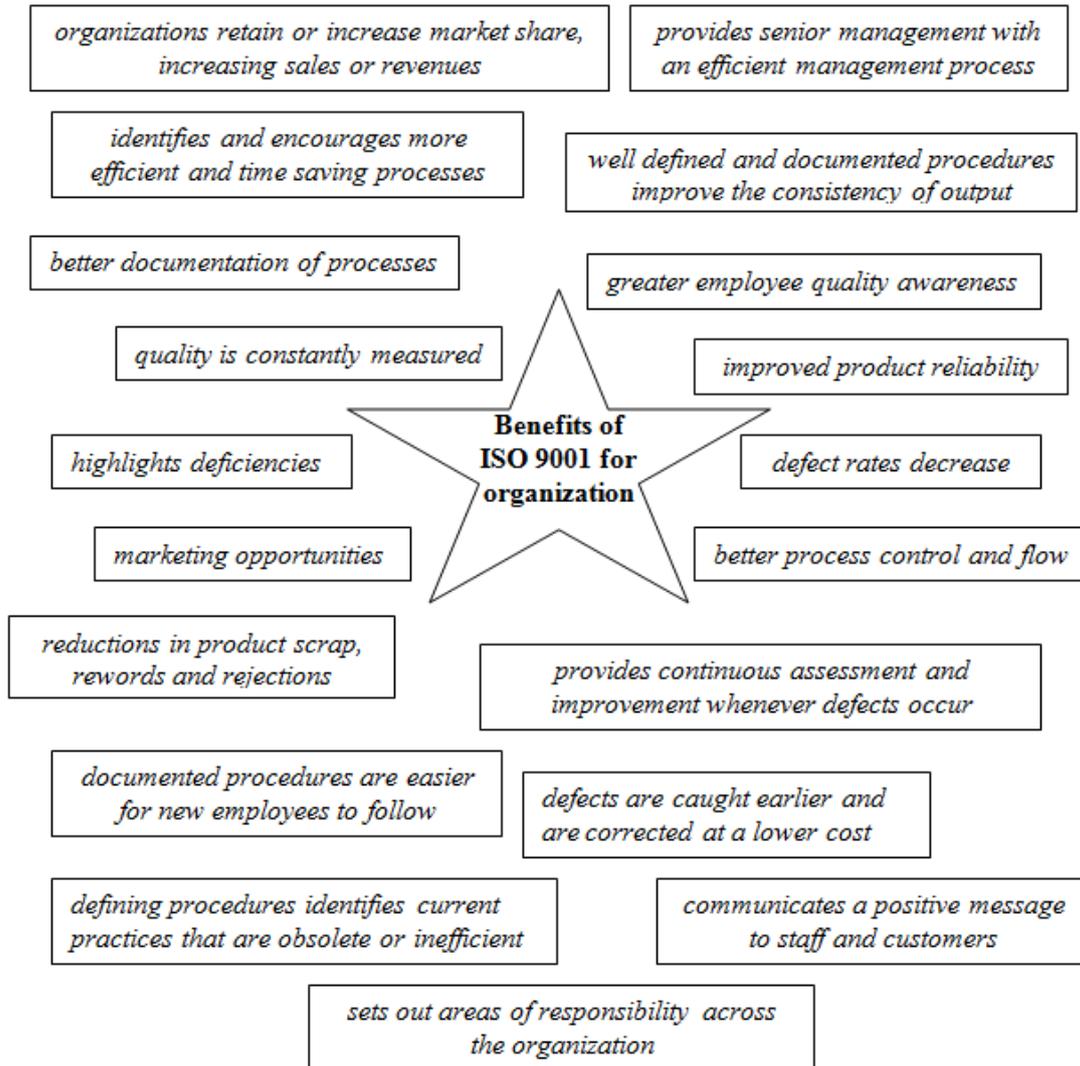
**ISO 9001 certification** is not just suitable for large organisations but also small businesses that will benefit from adopting efficient quality management systems that will save time and cost, improve efficiency and ultimately improve customer relationships.

Changes in your business' operations will always create some additional load on your business, however the results of implementing a Quality Management System (QMS) are well worth the effort as you move forward.

Blueprints are one of the many things that are being made obsolete by technology and electronic files. Implementing a QMS (like ISO 9000) is a similar situation - a little work up front, but after a short time the benefits of ISO in your organization will be clearly seen.

Organizations are recognizing that an effective Quality Management System leads to reduced costs and greater operating margins. A well designed and implemented Quality Management System based on ISO 9001 has been shown to provide organizations with the following benefits (<http://the9000store.com/>; <http://www.iso9001.com/benefitsofiso9001.asp>):

Figure 28: Benefits of ISO 9001 for organization



There are also some of the benefits to company's customers (<http://www.iso9001.com/benefitsofiso9001.asp>):

- improved quality and service,
- delivery on time,
- right first time attitude,
- fewer returned products and complaints,
- independent audit demonstrates commitment to quality.

Organizations that implement an effective business management system create a confidence among their stakeholders in the capability of their processes and the reliability of their products and or services; while at the same time, benefiting from improved risk management. In addition, an effective business management system serves to create the basis for continual improvement leading to increased customer satisfaction and ultimately to the success of the organization (<http://www.saiglobal.com/training/assurance/quality-management/>).

### **ISO 9004 “Development point”**

ISO 9004:2009 (replaces ISO 9004:2000) Guidance Document. Managing for the sustained success of an organization. A quality management approach.

ISO 9004 is part of the ISO 9000 family of Standards including ISO 9000 and ISO 9001.

ISO 9004 now includes information on managing for the sustained success of an organization. The standard has had substantial changes made to its structure and contents. ISO 9004 is intended to go beyond ISO 9001 and examine satisfaction for interested parties.

ISO 9004 is a quality management standard. It was first published in 1994, updated in 2000 and again in 2009. This current version was officially published on November 1, 2009 and is the third edition of the ISO 9004 standard. It cancels and replaces all previous editions (<http://www.praxiom.com/iso-9004-intro.htm>).

ISO 9004 defines a set of quality management guidelines or recommendations (Parts 4 to 9). We refer to them as guidelines or recommendations because they're voluntary. They're not requirements or contractual obligations, suggestions only. They apply to all types of organizations. It doesn't matter what size or what do. Any organization can benefit from following ISO's quality management recommendations.

In the past, ISO 9004 contained the ISO 9001 standard and used the same numbering system. They were designed to be used as “a consistent pair of standards on quality management”. Now the link between ISO 9001 and ISO 9004 has been broken. ISO 9004 now seems to be heading off in a new direction.

The purpose of the new ISO 9004 standard is to help organizations to achieve sustained success by using a quality management approach. This is a departure from earlier versions and is a major change in focus.

According to ISO 9004 2009, an organization achieves sustained success when it meets its objectives and continues to do so over the long term. It further says that objectives can only be achieved if the organization consistently meets the needs and expectations of interested parties (stakeholders).

The sustained success of an organization is the result of its ability to achieve and maintain its objectives in the long-term. The achievement of sustained success for any organization is a complex and demanding challenge in an ever-changing environment (<http://the9000store.com/what-is-iso-9004.aspx>).

How to achieve sustained success (<http://the9000store.com/what-is-iso-9004.aspx>):

- by meeting the needs and expectations of your customers,
- by the effective management of your organization,
- through awareness of your organization's environment,
- by learning and improving.

The new ISO 9004 standard become a success management standard. Sustained success is now the goal of the standard. According to ISO 9004, organizations can achieve this goal by using a quality management approach.

The new revision to ISO 9004 came off the press in the last quarter of 2009. It is significantly different from its predecessor. ISO 9004:2009 embodies the quality management principle relating to continual improvement. The technical experts made bold strides in their quest to address market needs by producing a standard that would help organizations maintain and improve their quality management systems over time. While that was the stated intent with the 2000 version, the fact is that the majority of users considered it a road map for implementing ISO 9001.

Individuals who were familiar with the 2000 version will have several questions. The first is: “Where’s 9001?” In ISO 9004:2009 the entire text of ISO 9001:2000 was embedded into the standard. The clauses, by and large, mirrored ISO 9001 and the structure was identical. Those who utilized ISO 9004 as a how-to guide for ISO 9001 had no trouble finding the relevant clauses. The only problem with that approach is that ISO 9004 was not intended to be a handbook on how to implement ISO 9001. It was intended, as the title plainly indicated, to provide “Guidelines for performance improvements.”

“Performance improvements” sounds like a great idea. Until you ask yourself the next question: “Why?” What is the value in improving performance? Within the answer lies the crux and purpose of both ISO 9001 and ISO 9004. That answer is found in ISO 9004’s new title — “Managing for the sustained success of an organization—A quality management approach.”

It’s not good enough to achieve ISO 9001, proudly displaying the coveted certificate on the wall. To conform to the requirements of ISO 9001, it’s important to maintain the quality management system that has been established. It’s important to consistently fulfill requirements found in multiple subclauses relating to establishing objectives), monitoring and measuring product and processes, reviewing changes that could affect the quality management system, and striving for continual improvement.

***So ISO 9004:2009 is about what you do after you’ve established and implemented your quality management system to keep it going and to make sure both you and your customers continue to derive benefit from your organization.***

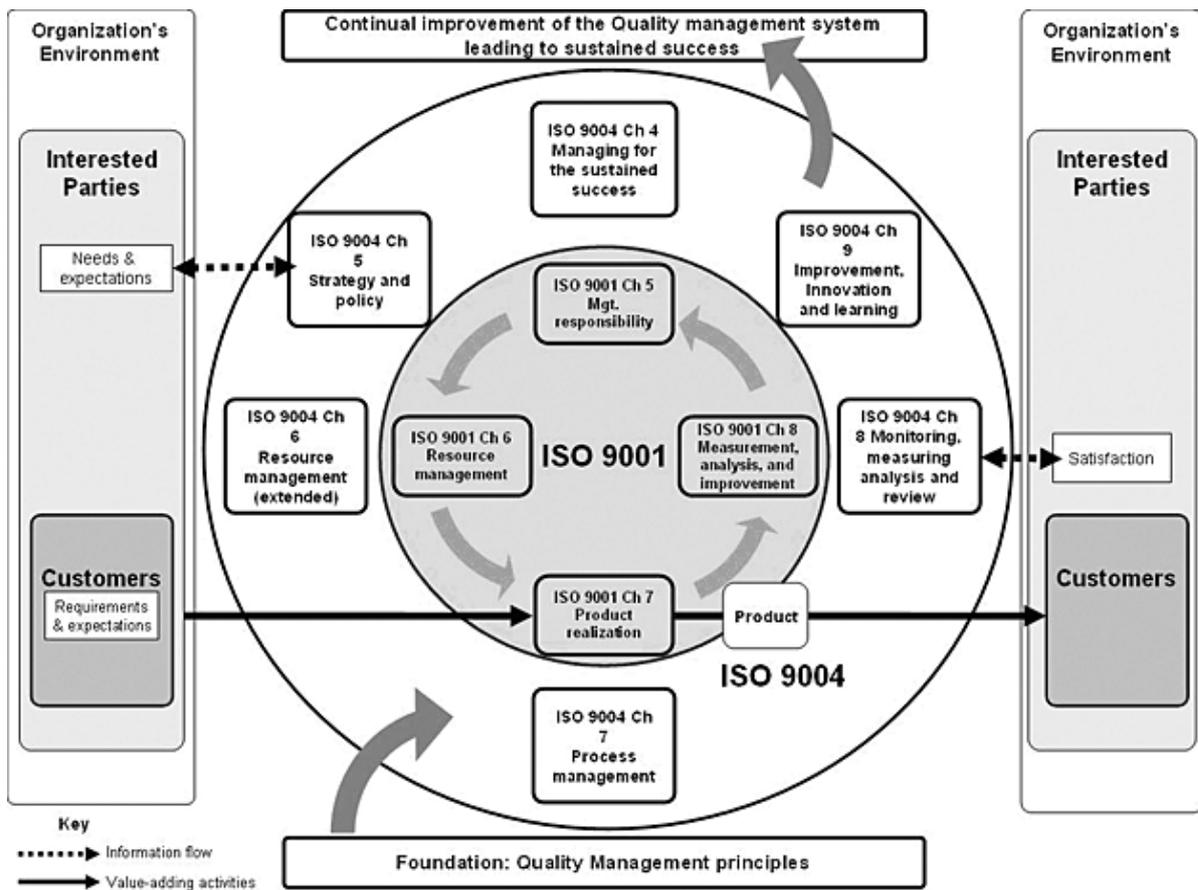
They get a reliable supplier and you get to stay in business. It also addresses one of the basic truisms of our universe: things change. Hence, the new ISO 9004, and particularly the annexes, is heavily weighted toward monitoring and periodically assessing so that you can respond to change.

The new version of ISO 9004 was structured to facilitate this quest.

The subclauses flow from the organization’s environment, to strategic planning, through resource management to managing processes, to monitoring and analyzing, and ending up with improvement, innovation, and learning. Think of it like this:

“This is who we are. This is the big plan for the organization. This is what we have to work with. This is how we do things. This is how we figure out what’s working and what isn’t. And these are the things that will allow us to still be around tomorrow—this is how we plan for our future.” Any of these can, and probably, will change over time. How your organization handles those changes will determine your “... sustained success.”

Figure 29: Extended model of a process-based quality management system



Source: <http://qualitevolution.blogspot.com/2013/04/excellence-canada-for-canada-iso-9004.html>

Under the first subclause we look at who we are. We also look at stakeholders, or as the standard refers to them, “interested parties.” This concept is situated early on in the standard because interested parties are directly relevant to our organization now and in the future. You could say they are an element of our identity. Interested parties can be customers, stockholders, employees, suppliers, and society at large, just to name a few. Changes with any of these interested parties affect our organization.

The next subclause talks about strategy and policy. This is a great step forward. It illustrates the very tight bond that should exist between the real business of the business and the quality management system. For too long top management in many organizations has considered the quality management system, and its requirements for management review and management involvement, as an odious infringement on their sanctum sanctorum. Time is overdue to recognize that a good quality management system is in harmony with strategic goals and planning.

Consideration of resources is another key factor that often changes over time. Monitoring what resources currently exist and which will be impacted by changes such as turnover of personnel, slower cash flow, cost of fossil fuel, and scarcity of raw materials, sequesters directly into the next section dealing with managing processes. It’s impossible for processes to remain consistent when support such as resources and infrastructure are changing.

You'll note throughout the emphasis on monitoring. This is carried through to annexes that give you tips on how to assess your organization. Doing it once gives you a starting point. But the assessments, just like any other effective monitoring tool, needs to be utilized cyclically to achieve any real benefit. The annexes are a useful guide; but you can also devise your own methodology to assess your organization. Whatever method you use, make sure that your assessment reflects interdependencies and interrelations between various factors. The results should help you identify what needs to be enhanced, what needs to be discarded, and what needs to be improved.

***Use ISO 9001 to build a great quality management system. Use ISO 9004 to maintain it and to help it to become even greater***

(<http://www.qualitydigest.com/inside/twitter-ed/iso-90042009-out-and-it-sure-looks-different.html>).

ISO's quality management recommendations are described in ISO 9004 Parts 4 to 9. The following material will briefly introduce these six sections.

Part 4 provides a general overview of the entire ISO 9004 standard. The rest of the standard examines this material in greater detail. Part 4 starts by asking you to adopt a quality management approach. In general, this means that you need to establish a process-based quality management system. According to Part 4, this system must be based on ISO's eight quality management principles. It also recommends that you monitor your organization's business environment, that you meet the needs and expectations of interested parties, that you take a long term planning perspective, and that you emphasize innovation and continual improvement.

Part 5 focuses on strategic management. It asks you to establish a mission, a vision, and values. It then asks you to establish processes to develop, implement, review, and update your organization's strategy and policies. It also asks you to establish processes to monitor your business environment, to identify the needs of interested parties, to assess your organization's capabilities, and to identify its future resource and technology needs.

Part 6 covers resource management. It asks you to provide resources and to establish processes to manage these resources efficiently and effectively. The term resources is very broad and covers many things. It covers both internal resources and external resources. Internal resources include your organization's information, technology, knowledge base, work environment, and infrastructure as well as its financial and human resources. And external resources include your organization's suppliers and partners as well as its energy and natural resource supplies.

Part 7 discusses process management. It expects you to create a network of interconnected processes and to adopt a process approach. The process approach is a management strategy. When managers use a process approach, it means that they manage the processes that make up their organization, the interaction between these processes, and the inputs and outputs that tie these processes together. It also expects you to appoint a process manager for each process and to give each manager the responsibility and authority to manage and control his or her process.

Part 8 deals with what we call evaluation management. It asks you to monitor, measure, analyze, and review your organization's performance. It expects you to establish and maintain processes for monitoring, collecting, and managing information about your organization and its business environment. Part 8 also wants you to measure your organization's performance by comparing its actual achievements against the results it plans to achieve. In order to do all of this, it

recommends the extensive use of key performance indicators (KPIs), internal audits, benchmarking, maturity self-assessments, and management reviews.

Part 9 covers change management. It encourages learning, innovation, and improvement. It asks you to set continual improvement objectives, to establish a continual improvement process, and to make continual improvement part of your culture.

It also wants you to identify your innovation needs, to establish an innovation process, and to provide resources to support innovation. Finally, it wants you to encourage improvement and innovation by supporting continuous learning throughout your organization (<http://www.praxiom.com/iso-9004-overview.htm>).

While ISO 9001 focuses on meeting the needs of customers, ISO 9004 goes beyond this and talks about meeting the needs of all interested parties (which includes not only customers but also shareholders, suppliers, partners, regulators, employees, unions, bankers, owners, and society in general). This is a farbroader and more outward looking perspective (<http://www.praxiom.com/iso-9004-intro.htm>).

### ***Comparison of ISO 9000 and ISO 14000***

Both families of standards consist of standards and guidelines relating to management systems, supporting standards for terminology and the specific tools / utilities; for example, checks in order to verify whether the management system in accordance with the standards, etc.

ISO 9000 is intended for quality management, under which defines the quality or characteristics of the product, process or service required by the client or customer. Quality management means that the company provides product characteristics that meet the requirements of customers (customers, subscribers).

ISO 14000 is intended for environmental management, which means that the organization minimizes adverse effects on the environment caused by its activities.

Both families of standards used for processes and products indirectly. Their suitability influenced by appropriate management. In the case of ISO 9000 to influence the quality assurance of the product, in the case of ISO 14000 is to influence the provision of minimum potential adverse impact of the process on the environment e.g. environmentally pleasant production or removal of harmful products, and reduced pollution, depletion of natural resources.

Both standards require such an organization of the production process to ensure the quality of the product or the least impact on the environment. The two families of standards have a similar structure, shown in the previous table, and similar approaches to achieve the objectives, which are of course the two cases, are different. ISO 14000 is therefore essential to complement the ISO 9000.

# ISO 19011 and ISO 26000

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## 1 Introduction of ISO 19011

ISO 19011 is one of those standards that can be thought of as existing in the overall ISO 9000 family (it is also part of another family but that still fits the image – two standards were married together to create this one and we usually accept that marriage results in membership of more than one family). The standard is entitled ‘Guidelines for quality and/or environmental systems auditing’. It is intended to provide a general description of how audits of all types – first, second and third party – should be carried out when auditing quality or environmental management systems. It is based on the understanding that the basic approach to both quality and environmental audits is essentially the same. Certainly, the framework and underlying rules for how to audit are similar. Each involves selection and qualification of auditors, planning, preparation, introduction, execution, analysis, reporting and corrective/improvement action. The specific things that are being looked for in an audit are quite different, so reservations about combining the actual audits, but to have a common central approach to the two seems very sensible and can make planning and scheduling, for example, much more efficient.

It should be noted that ISO 19011 is not a mandatory or systems certification standard. Assessors examining organizations for ISO 9001 compliance may have ISO 19011 in the back of their mind when looking at good audit practice but cannot raise non-compliances specifically against its contents. There are some auditor and training registration schemes that are founded on ISO 19011, but it is the requirements of their own arrangements that are typically used as bases on which to make judgements, not the contents of the standard itself. In fact, the introduction to the standard itself states that its guidance is intended to be flexible; the extent to and manner in which they are adopted will depend upon the size, nature and complexity of the organization carrying out the audits. In this sense it might be thought of in the same way that we would often use a management text book or seminar – we would consider what we have learnt and then decide what lessons we will decide to apply, where and in what manner (<https://www.ashgate.com/pdf/SamplePages/qualaudit2ch5.pdf>).

## 2 History

ISO 19011 is a brand new standard, issued in 2002 as ISO 19011:2002 it represents the first version. Prior to this, quality auditing was described in ISO 10011, which was issued in three parts describing different aspects of managing and conducting audits, and was released in 1990–91.

The general history of the quality audit standard is similar to that of the quality management systems standard, with new issues usually lagging those of the management standard and without any necessary direct link between a version of one and a version of the other (i.e. just because the management systems standard is changed does not mean the associated audit standard is no longer valid). There was much talk when ISO 9001:2000 was first released (and even before, when drafts were available) that quality auditing would have a heavy process flavor, yet this emphasis does not particularly stand out in ISO 19011. Many quality professionals and third party auditors still take this stance, but it must be emphasized that there is no specific

guidance in ISO 19011 stating that audits must be planned or carried out in relation to boundary-crossing processes.

ISO 19011 also replaces the previous environmental audit standards which were issued in 1996 to coincide with the release of ISO 14001:1996 (the standard for environmental management systems). Again, the environmental audit standards were in three parts, but in this case were available as three separate standards: ISO 14010, ISO 14011 and ISO 14012. Many of the good points from these standards (such as the concept of the audit 'client') have been brought forward into the combined standard (<https://www.ashgate.com/pdf/SamplePages/qualaudit2ch5.pdf>).

### 3 Characteristics of ISO 19011

ISO 19011:2011 is a standard for auditing management systems. It was developed by ISO Technical Committee 176, Subcommittee 3. ISO/TCC176176 is responsible for "quality management and quality assurance" and SC 3 is responsible for "supporting technologies".

The official name of this standard is ISO 19011:2011 Guidelines for auditing management systems. They're referred to as guidelines because they're voluntary. They're not requirements or contractual obligations (ISO 19011:2011).

ISO 19011:2011 provides guidance on the first, second and third party auditing. It replaces the 2002 version, which had previously been focused specifically on quality and environmental auditing. The publication of this new revision to ISO 19011 forms part of a larger initiative by ISO to promote harmonization of its various management system standards, and to make life easier for those organizations that choose to implement a single (integrated) system to address the requirements of more than one standard. In this context, ISO is currently in the final stages of consensus of its ISO Guide 83, which is aimed at the developers of management system standards, and provides a common structure, format and a significant amount of "identical text" for future standards and for future revisions to existing standards.

As with the previous (2002) version, ISO 19011:2011 continues to be "principles based", but a new principle ("confidentiality") has been added. This now means that the six principles of auditing are (ISO 19011:2011):

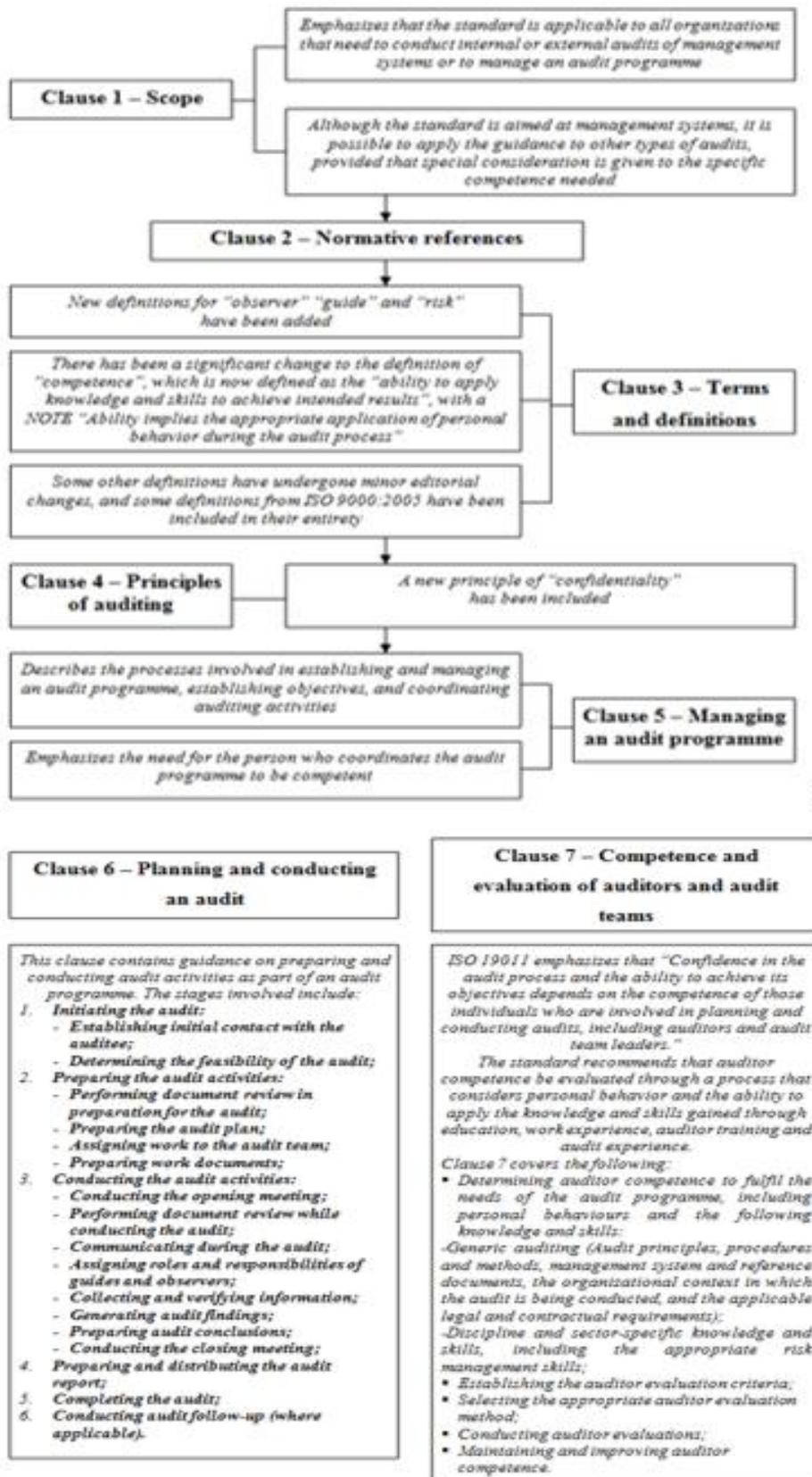
- **Integrity** – "The foundation of professionalism";
- **Fair presentation** – "The obligation to report truthfully and accurately";
- **Due professional care** – "The application of diligence and judgement in auditing";
- **Confidentiality** – "Security of information";
- **Independence** – "The basis for the impartiality of the audit and objectivity of the audit conclusions";
- **Evidence-based approach** – "The rational method for reaching reliable and reproducible audit conclusions in a systematic audit process".

The other main differences of ISO 19011:2011 compared with the 2002 version are as follows (ISO 19011:2011):

- The possibility for remote audit methods to complement traditional auditing has been introduced;
- Clauses 5, 6 and 7 have been reorganized, relating to the planning of the audit programme, performing individual audits and guidance on personnel competence and evaluation;

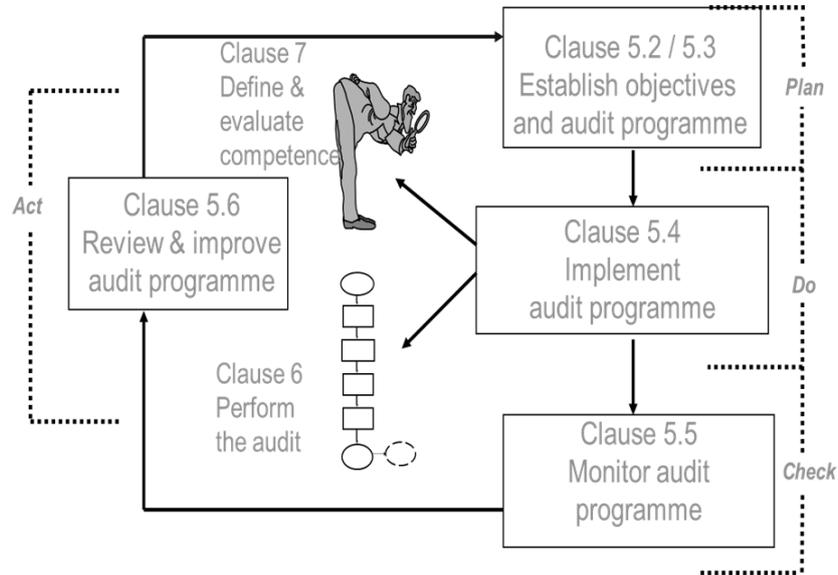
- The concept has been introduced that some additional document review activities might be necessary during the actual audit;
- Additional information has been included in a new Annex B, resulting in the removal of the “help boxes” from the text of the 2002 version;
- The competence determination and evaluation process has been strengthened, and includes other key personnel as well as auditors and audit team leaders;
- Illustrative examples of discipline-specific knowledge and skills have been included in a new Annex A.

Figure 30: The clause sequence of ISO 19011



A schematic diagram showing the use of the Plan-Do-Check-Act cycle in managing the audit programme is shown in Figure 2.

Figure 31: Managing the audit programme using the PDCA Cycle



The standard concludes with two informative annexes:

**Anex A** – Provides guidance and illustrative examples of discipline-specific knowledge and skills of auditors. The examples mentioned are for:

- Transportation safety;
- Environmental management;
- Quality management;
- Records management;
- Resilience, security, preparedness and continuity management;
- Information security;
- Occupational health and safety.

**Anex B** – Provides additional guidance (that was previously incorporated into the main text of the 2002 version of ISO 19011) on the following topics:

- Applicable audit methods;
- Conducting document review;
- Sampling criteria:
  - Amostragem com base na experiência e intuição dos auditores;
    - Judgement-based sampling;
    - Statistical sampling;
- Preparing work documents;
- Selecting sources of information;
- Guidance on visiting the auditee’s location;
- Conducting interviews;
- Audit findings:
  - Determining audit findings;
  - Recording conformities;
  - Recording nonconformities;
  - Dealing with findings related to multiple criteria.

#### 4 Who should use ISO 19011:2011

Use ISO 19011 if (<http://www.praxiom.com/iso-19011-intro.htm>):

- You need to improve your audit process.
- You need to develop your own audit program.
- You need to train management system auditors.
- You need to manage and control audit activities.
- You need to do audits to comply with contracts.
- You need to certify management system auditors.
- You need to evaluate the competence of auditors.
- You need to audit your own management systems.
- You need to make a self-declaration of compliance.
- You need to carry out audits for regulatory reasons.
- You need to audit your supplier's management system.

Table 17: *Scope of use ISO 19011*

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- risk management systems,</li> <li>- safety management systems,</li> <li>- health management systems,</li> <li>- quality management systems,</li> <li>- energy management systems,</li> <li>- service management systems,</li> <li>- disaster management systems,</li> <li>- records management systems,</li> <li>- document management systems,</li> </ul> | <ul style="list-style-type: none"> <li>- emergency management systems,</li> <li>- food safety management systems,</li> <li>- sustainability management systems,</li> <li>- environmental management systems,</li> <li>- business continuity management systems,</li> <li>- information security management systems,</li> <li>- transportation safety management systems,</li> <li>- supply chain security management systems,</li> <li>- organizational resilience management systems,</li> <li>- occupational health and safety management systems.</li> </ul> |
|---|---|

Source: <http://www.praxiom.com/iso-19011-intro.htm>

ISO 19011 can be used by any organization no matter what size it is or what it does. It can be used by both public and private organizations and by groups, associations, and enterprises of all kinds. It is not specific to any sector or industry and can be used to improve any audit process.

However, exactly how you apply ISO 19011 is up to you and will depend on your organization's needs, objectives, and challenges, and should reflect what it does and how it operates.

Summarizing this chapter, we can say, that ISO 9000 family contains: ISO 9001:2008 - sets out the requirements of a quality management system, ISO 9000:2005 - covers the basic concepts and language, ISO 9004:2009 - focuses on how to make a quality management system more efficient and effective, ISO 19011:2011 - sets out guidance on internal and external audits of quality management systems. Through the implementation of ISO, we can achieve a lot of advantages connected with among others: increased efficiency and revenue, better employee morale, improving supplier relationships, effective and structured documentation and building customer satisfaction. The ISO implementation also brings disadvantages, such as: increasing bureaucracy, unit costs increase or decrease in work efficiency. However, the implementation of ISO 9000 benefits far outweighs any disadvantages.

## 5 Introduction of ISO 26000

**ISO 26000 is a voluntary guidance standard on social responsibility that can be used by any organization.** Business leaders to plan and implement actions to improve their sustainability – economically, socially, and environmentally, can use it.

For many successful businesspeople, being socially responsible is a part of who they are and why they are in business: to provide useful products and services, to provide jobs and development opportunities for their communities, and to gain satisfaction through meaningful work. In many countries, these “socially responsible entrepreneurs” have been quietly making a difference by acting on their values and principles, and inspiring others. They have the spirit of social responsibility already (Ingaldi, Lestyánszka Škúrková 2013; Kardas, Brožová 2013).

### **The purpose of ISO 26000**

ISO 26000 is a response to the urgent need for all people, from all parts of the world, to have a positive impact on those around them, through the way they do business and live their lives. ISO 26000 provides broad guidance, but does not offer specific instructions or require specific outcomes. Businesses that implement ISO 26000 have opportunities to identify and act on their own priorities, and to build stronger business models in the spirit of “continuous improvement.” Implementers of ISO 26000 will develop their unique corporate social responsibility programs and become models for others (Handbook for Implementers of ISO 26000. 2011). The outline of ISO 26000 is presented in Table 2.

*Table 18: Outline of ISO 26000 (ISO 26000 social responsibility. www.iso.org)*

| Clause title  | Clause number | Description of clause contents  |
|---|---------------|---|
| Scope   | Clause 1      | Defines the scope of ISO 26000 and identifies certain limitations and exclusions  |
| Terms and definitions                                       | Clause 2      | Identifies and provides the definition of key terms that are of fundamental importance for understanding social responsibility and for using ISO 26000  |
| Understanding social responsibility                         | Clause 3      | Describes the important factors and conditions that have influenced the development of social responsibility and that continue to affect its nature and practice. It also describes the concept of social responsibility itself - what it means and how it applies to organizations. The clause includes guidance for small and medium sized organizations on the use of ISO 26000.             |
| Principals of social responsibility                         | Clause 4      | Introduces and explains the principles of social responsibility.  |
| Recognizing social responsibility and engaging stakeholders | Clause 5      | Addresses two practices of social responsibility: an organization’s recognition of its social responsibility, and its identification of and engagement with its stakeholders. It provides guidance on the relationship between an organization, its stakeholders and society. On recognizing the core subjects and issues of social responsibility and on a organization’s sphere of influence. |

|   |          |  |
|---|----------|--|
| Guidance on social responsibility core subjects                       | Clause 6 | Explains the core subjects and associated issues relating to social responsibility. For each core subject, information has been provided on its scope, its relationship to social responsibility, related principles and considerations, and related actions and expectations.   |
| Guidance on social responsibility throughout an organization          | Clause 7 | Provides guidance on putting social responsibility into practice in an organization. This includes guidance related to: understanding the social responsibility of an organization, integrating social responsibility throughout an organization, communication related to social responsibility, improving the credibility of an organization regarding social responsibility, reviewing progress and improving performance and evaluating voluntary initiatives for social responsibility. |
| Examples of voluntary initiatives and tools for social responsibility | Annex A  | Presents a non-exhaustive list of voluntary initiatives and tools related to social responsibility that address aspects of one or more core subjects of the integration of social responsibility throughout an organization.   |
| Abbreviated terms   | Annex B  | Contains abbreviated terms used in ISO 26000   |
| Bibliography  |          | Includes references to authoritative international instruments and ISO standards that are referenced in ISO 26000 as source material.  |

ISO 26000 refers to the responsibility of an organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour that:

- contributes to sustainable development, including health and the welfare of society;
- takes into account the expectations of stakeholders;
- is in compliance with applicable law and consistent with international norms of behaviour;
- is integrated throughout the organization and practiced in its relationships.

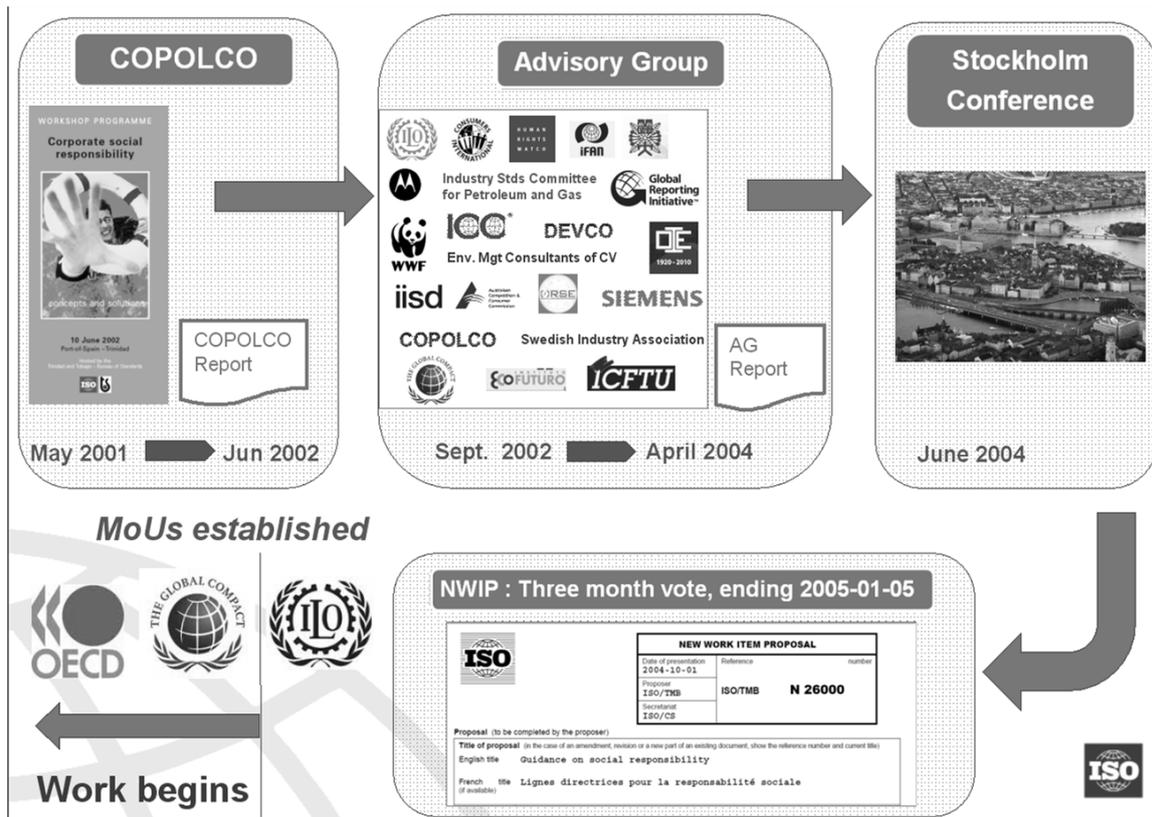
ISO 26000 is not a management system standard. It is not intended or appropriate for certification purposes or regulatory or contractual use. Any offer to certify, or claims to be certified, to ISO 26000 would be a misrepresentation of the intent and purpose and a misuse of this International Standard. As ISO 26000 does not contain requirements, any such certification would not be a demonstration of conformity with this International Standard (Handbook for Implementers of ISO 26000. 2011).

### ***History of ISO 26000***

The need for ISO to work on a social responsibility (SR) standard was first identified in 2001 by ISO/COPOLCO, Committee on consumer policy. In 2003, the multi-stakeholder ISO Ad Hoc Group on SR, which had been set up by ISO's Technical Management Board (TMB), completed an extensive overview of SR initiatives and issues worldwide.

In 2004, ISO held an international, multi-stakeholder conference on whether or not it should launch SR work. The positive recommendation of this conference led to the establishment in late 2004 of the ISO Working Group on Social Responsibility (ISO/WG SR) to develop the future ISO 26000 standard. In Figure 16 the beginning of ISO 26000 was presented.

Figure 32: How the ISO 26000 effort got started



Source: Steele R., ISO 26000

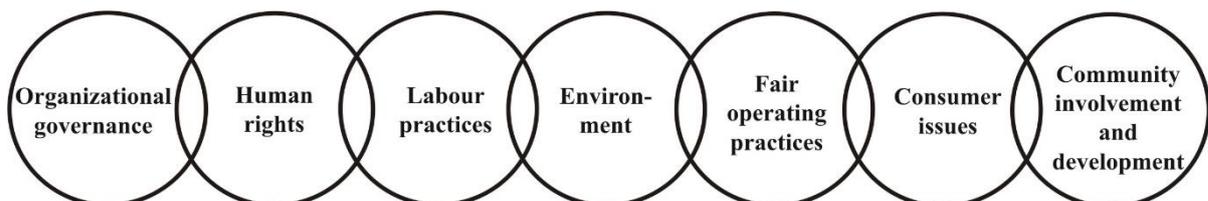
## 6 Key elements of ISO 26000 - Stakeholders, Core Subjects and Reporting

There are 3 key elements of ISO 26000 (Handbook for Implementers of ISO 26000, 2011):

**1) Stakeholders** are those people and groups that are affected by the actions of your business. These can include workers, suppliers, community residents, consumers, and investors. Communicating with them is one of the best ways a business can find out where it is doing a good job, and where it could improve.

**2) Core Subjects.** ISO 26000 identifies seven core subjects (Figure 17) that socially responsible businesses should address. Implementers of ISO 26000 should evaluate their actions in each of the core subjects, to identify what they are doing in their current practices, and to set priorities for improvements. In Figure 4 the relation of 7 core subject is presented with their corresponding clause numbers in ISO 26000.

Figure 33: 7 core subject



Source: Baggio 2014

- *Organizational governance* – practicing accountability and transparency at all levels of your organization; using leadership to create an organizational culture which uses core values of social responsibility when making business decisions.
- *Human rights* – treating all individuals with respect; making special efforts to help people from vulnerable groups.
- *Labour practices* – providing just, safe and healthy conditions for workers; engaging in two-way discussions to address workers’ concerns.
- *Environment*– identifying and improving environmental impacts of your operations, including resource use and waste disposal.
- *Fair operating practices* – respecting the law; practicing accountability and fairness in your dealings with other businesses, including your suppliers.
- *Consumer issues* – providing healthy and safe products, giving accurate information, and promoting sustainable consumption.
- *Community involvement and development* – getting involved in the betterment of the local communities that your organization operates in; being a good neighbour.

Figure 34: The relation of 7 core subject



Source: The figures denote the corresponding clause numbers in ISO 26000) (<http://www.iso.org/sites/iso26000launch/documents.html>)

**3) Reporting.** This is a valuable tool for engaging stakeholders and for promoting your achievements. Implementers of ISO 26000 should report on activities and decisions in as many of the seven core subjects as they can. If they do not address a core subject, they need to: (1) explain why they omitted it, and (2) include it in a plan for consideration in the future. Third-party involvement or “attestations” can strengthen your reports and make your social responsibility claims more credible to reviewers and to the public.

## 7 Characteristics of social responsibility

An organization’s performance in relation to the society in which it operates and to its impact on the environment has become a critical part of measuring its overall performance and its ability to continue operating effectively. This is, in part, a reflection of the growing recognition of the need to ensure healthy ecosystems, social equity and good organizational governance. In the long run, **all organizations’ activities depend on the health of the world’s ecosystems.**

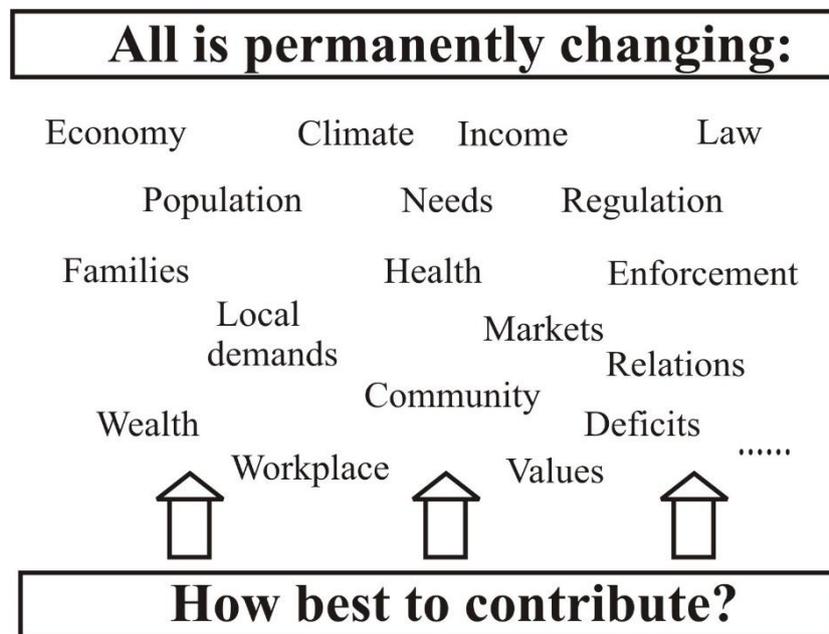
Organizations are subject to greater scrutiny by their various stakeholders (ISO 26000 social responsibility. www.iso.org).

To behave in a socially responsible manner is something full of dynamics because societies' needs and demands change on a daily basis. These permanently changing priorities challenge the creativity of organizations, staff and leadership, in identifying the currently most important and effective contributions. ISO has taken a wise decision to offer "only" a guidance standard, and has banned certification, jointly with IAF, the International Accreditation Forum.

A "social responsibility certificate" would demonstrate that both the receiver and the issuer may not have sufficiently understood the essential character of social responsibility: its dynamics (Figure 6).

So, to certify a socially responsible behaviour of an organization is something theoretical, an artificial construct (Gürtler, 2011).

Figure 35: The dynamics of social responsibility



Source: Gürtler 2011

**Social responsibility is a broad subject and not one that can be overlooked by any organisation that wishes to have a successful future.** It is centred on taking ownership of the impact that an organisation's decisions and activities have on the society and environment in which it operates.

The 1953 book the 'Social Responsibilities of the Businessman' by Howard Bowen is often heralded as the start of the modern debate about the issues that organisations need to consider, but it was in the 1970s that the focus increased. The first consideration was an organisation's philanthropic activity, such as giving to charity. This gradually expanded over the years to include elements such as labour and fair operating practices, human rights, the environment, countering corruption and consumer protection.

Globalisation and the ease with which information is shared on an international scale have majorly affected the II. CORPORATE SOCIAL RESPONSIBILITY AND THE ISO 26000 necessity to consistently consider the effect of business practices. With these factors and concerns for global

environmental issues and the increasing economic interdependence of countries around the world, it is no surprise that social responsibility has now come to the forefront of corporate strategic planning. There have also been a number of international instruments and agendas that have emphasised the growing global interdependence such as the Rio Declaration on Environment and Development, the Johannesburg Declaration of Sustainable Development and the Millennium Development Goals. Now, organisations are expected to exhibit their social responsibility through transparent and ethical behaviour that contributes to, and protects society in a number of different ways. Organisations need to demonstrate explicitly that they act within internationally accepted norms of behaviour at the same time as complying with the laws of each country. They also need to clearly contribute to the sustainable development of the societies they operate in, paying careful attention to health and welfare issues. In order to do all this effectively an organisation needs to integrate the views and wishes of all stakeholders and ensure that the full range of socially responsible behaviours are adopted throughout the organisation and are practised in all relationships. (Bowens, 2011).

## 8 How to implement ISO 26000

After considering the characteristics of social responsibility and its relationship with sustainable development (Clause 3), it is suggested that an organization should review the principles of social responsibility described in Clause 4. In practicing social responsibility, organizations should respect and address these principles, along with the principles specific to each core subject (Clause 6). Before analysing the core subjects and issues of social responsibility, as well as each of the related actions and expectations (Clause 6), an organization should consider two fundamental practices of social responsibility: recognizing its social responsibility within its sphere of influence, and identifying and engaging with its stakeholders (Clause 5). Once the principles have been understood, and the core subjects and relevant and significant issues of social responsibility have been identified, an organization should seek to integrate social responsibility throughout its decisions and activities, using the guidance provided in Clause 7. This involves practices such as: making social responsibility integral to its policies, organizational culture, strategies and operations; building internal competency for social responsibility; undertaking internal and external communication on social responsibility; and regularly reviewing these actions and practices related to social responsibility. Further guidance on the core subjects and integration practices of social responsibility is available from authoritative sources (Bibliography) and from various voluntary initiatives and tools (some global examples of which are presented in Annex A: Examples of cross-sectoral initiatives, like UNEP - Life Cycle Initiative and Examples of sectoral initiatives, like UNEP - Sustainable Buildings and Construction Initiative). When approaching and practising social responsibility, the overarching goal for an organization is to maximize its contribution to sustainable development (Gürtler, Graziani 2010; Kotus, Pauliček, Jankaj, Spišáková, Holota, Ingaldi 2014).

According to (Gürtler, Graziani 2010) to use properly ISO 26000 it is important to identify the relevant issue, possible activities and their impact in the organization – 5<sup>th</sup> step of the guidance (Table 3).

*Table 19: Identification of the relevance of issues, your possible activities and their impact*

|  |            |            |            |            |            |            |             |
|--|------------|------------|------------|------------|------------|------------|-------------|
|  | Question 1 | Question 2 | Question 3 | Question 4 | Question 5 | Question 6 | Way forward |
|--|------------|------------|------------|------------|------------|------------|-------------|

| CORE SUBJECTS and ISSUES  | Is the core subject and its issues judged <u>relevant</u> for my | What <u>leverage</u> does my organization have | What <u>kind of</u> activities can my organization undertake on this | Can I be sure that planned activities are <u>not in conflict</u> with <u>applicable</u> law? | What <u>impact</u> will my activities | Which stakeholders should I involve on | Further <u>planned</u> activities and their possible impact. |
|---|--|--|--|--|---------------------------------------|--|--|
| <b>6.2 Organizational Governance</b>  |  |  |  |  |                                       |  |  |
| Accountability, transparency, ethical behaviour, respect for stakeholder interests, and respect for the rule of law |  |  |  |  |                                       |  |  |
| <b>6.3 Human rights</b>   |  |  |  |  |                                       |  |  |
| Due diligence   |  |  |  |  |                                       |  |  |
| Human rights risk situations  |  |  |  |  |                                       |  |  |
| Avoidance of complicity   |  |  |  |  |                                       |  |  |
| Resolving grievances  |  |  |  |  |                                       |  |  |
| Discrimination and vulnerable groups  |  |  |  |  |                                       |  |  |
| Civil and political rights  |  |  |  |  |                                       |  |  |
| Economic, social and cultural rights  |  |  |  |  |                                       |  |  |
| Fundamental rights at work  |  |  |  |  |                                       |  |  |
| <b>6.4 Core subject Labour practices</b>  |  |  |  |  |                                       |  |  |
| Employment and employment relationships   |  |  |  |  |                                       |  |  |
| Conditions of work and social protection  |  |  |  |  |                                       |  |  |
| Social dialogue   |  |  |  |  |                                       |  |  |
| Health and safety at work   |  |  |  |  |                                       |  |  |
| Human development and training in the workplace   |  |  |  |  |                                       |  |  |
| <b>6.5 The environment</b>  |  |  |  |  |                                       |  |  |

|   |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
| Prevention of pollution   |  |  |  |  |  |  |  |
| Sustainable resource use  |  |  |  |  |  |  |  |
| Climate change mitigation and adaptation  |  |  |  |  |  |  |  |
| Protection and restoration of the natural environment                           |  |  |  |  |  |  |  |
| <b>6.6 Fair operating practices</b>   |  |  |  |  |  |  |  |
| Anti-corruption   |  |  |  |  |  |  |  |
| Responsible political involvement   |  |  |  |  |  |  |  |
| Fair competition  |  |  |  |  |  |  |  |
| Promoting social responsibility in the sphere of influence                      |  |  |  |  |  |  |  |
| Respect for property rights   |  |  |  |  |  |  |  |
| <b>6.7 Consumer Issues</b>  |  |  |  |  |  |  |  |
| Fair marketing, factual and unbiased information and fair contractual practices |  |  |  |  |  |  |  |
| Protecting consumers' health and safety   |  |  |  |  |  |  |  |
| Sustainable consumption   |  |  |  |  |  |  |  |
| Consumer service, support, and dispute resolution                               |  |  |  |  |  |  |  |
| Consumer data protection and privacy  |  |  |  |  |  |  |  |
| Access to essential services  |  |  |  |  |  |  |  |
| Education and awareness   |  |  |  |  |  |  |  |
| <b>6.8 Community involvement and development</b>                                |  |  |  |  |  |  |  |
| Community involvement   |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| Education and culture                      |  |  |  |  |  |  |  |
| Employment creation and skills development |  |  |  |  |  |  |  |
| Technology development and access          |  |  |  |  |  |  |  |
| Wealth and income creation                 |  |  |  |  |  |  |  |
| Health                                     |  |  |  |  |  |  |  |
| Social investment                          |  |  |  |  |  |  |  |

*Source: Gürtler, Graziani 2010*

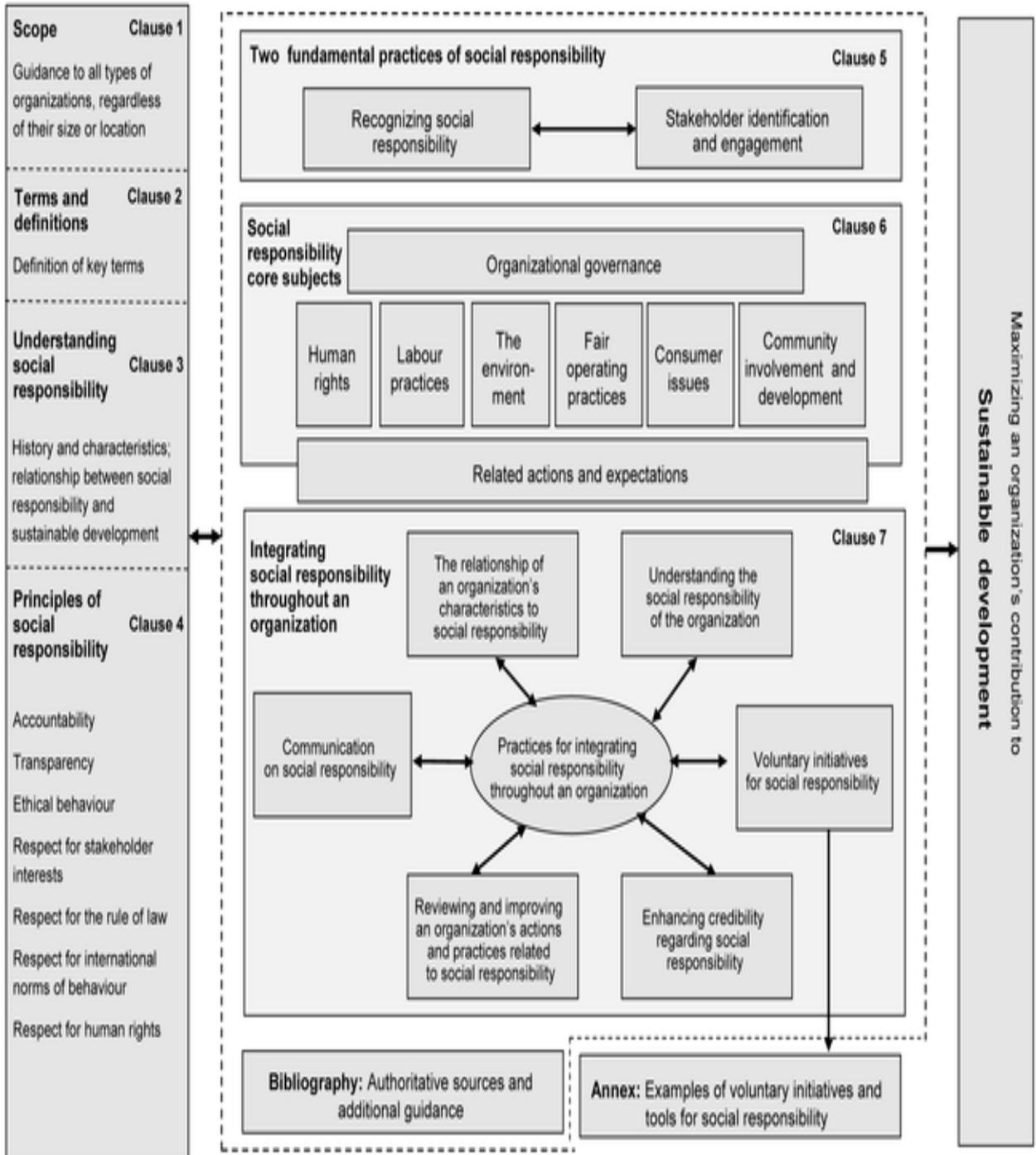
## 9 Conclusion

Available publications show main advantages of ISO 26000 implementation (ISO 26000 social responsibility. [www.iso.org](http://www.iso.org)):

- Competitive advantage
- Reputation
- Ability to attract and retain workers or members, customers, clients or users
- Maintenance of employees' morale, commitment and productivity
- View of investors, owners, donors, sponsors and the financial community
- Relationship with companies, governments, the media, suppliers, peers, customers and the community in which it operates

To sum up the ISO 26000 it is good to present all idea in a graphical way. The following graphic (Figure 7) provides an overview of ISO 26000 and is intended to assist organizations in understanding relations between the various clauses of the standard.

Figure 36: Schematic overview of ISO 26 000



Source: <http://www.iso.org/sites/iso26000launch/documents.html>

Summing up, why social responsibility is so important, every company, every organisation operates in the environment. It depends on what happens in this environment and the same time all its activities and decision have an impact on society and this environment. According to sustainable development concept, every company, every organisation should operate in the way that is able to sustain finite resources necessary to provide for the needs of future generations of life on the planet. Nowadays we have more and more companies, all of them have bigger or smaller impact on the ecosystem. So standard ISO 26000 was needed to help them to manage in a socially responsible way.

## **Basic state requirements for environmental aspects to enterprises in the Russian Federation**

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Speaking about the development of legislation in the field of the environment, Russia needs to focus on the basic state requirements to enterprises in the field of ecology.

Activities in the field of industrial environmental management are determined by the state through the authorities of state environmental control and management. In practice, government regulation is carried out through a system of environment protection provisions guaranteed by the laws and regulations of federal, regional and local levels. Activity in the field of industrial environmental management is regulated by GOST 24525.4-80 "Environmental management. Management of production associations and industrial enterprises. The main provisions" and is compulsory.

Activities of economic entities in the field of environmental management are not required. Such activities cannot be introduced into the framework of another formal compulsory activity of industrial enterprises. The state can only initiate and encourage the development of environmental management, using a variety of indirect measures and actions, for example, through a system of licensing, taxation, insurance, environmental impact assessment, etc.

The Law "On Environmental Protection" is the basic document that defines and regulates environmental activity in the Russian Federation.

In accordance with the Article 68 of the Law:

1. Environmental control sets following tasks: monitoring the state of the environment and its changes under the influence of economic and other activities; verification of compliance with plans and activities for nature protection, rational use of natural resources, improvement of the environment, compliance with the requirements of environmental legislation and quality standards of the environment.
2. The system of environmental control consists of a public service monitoring of the environment, state and industrial control.

In accordance with the Article 71 of the Law:

1. The industrial environmental monitoring is carried out by environmental services of businesses, organizations, institutions and aims to test the implementation of plans and measures for conservation and improvement of the environment, rational use and reproduction of natural resources, regulatory compliance of the environmental quality and compliance with environmental legislation.
2. The procedure for the organization of industrial environmental monitoring is governed by the provisions approved by the enterprises, institutions and organizations on the basis of this Act.

It should be emphasized that the Law establishes mandatory implementation of industrial environmental monitoring in the Regulation on which the plant may include any requirements which do not contradict the current environmental legislation. Practically we are talking about self-control of the enterprise over its activities in the field of environmental protection.

Other active main regulations that govern various aspects of environmental performance of a company include:

- Water Code of the Russian Federation;
- Limited amount of toxic industrial waste, permissible for storage in solid waste storage pits (landfills) (regulatory document);
- Terms of receiving industrial wastewater into the sewage system of an inhabited locality;
- The RSFSR Law "On enterprises and entrepreneurial activities";
- The RSFSR Law "On Atmospheric Air Protection";
- Guidance on control over air pollution sources;
- Terms of protection of surface water against pollution;
- The RSFSR Law "On the sanitary and epidemiological welfare of the population";
- GOST 24525.4-80. "Environmental management. Management of a production association and industry. Key provisions. "

State standard was the main category of standards in the USSR, today it is the interstate standard in the CIS. It is accepted by the Interstate Council for Standardization, Metrology and Certification (IGU). Currently the regulations are extrajudicial acts.

Development of state standards in the USSR began in 1925, when the Committee for Standardization under the Council of Labor and Defense of the USSR was organized. The Committee approved on May 7, 1926 the first All-Union standard OST-1 "Wheat. Selective grain varieties. Nomenclature". On November 23, 1929 a resolution on criminal liability for failure to comply with mandatory standards was adopted.

In 1940 the decree of the Council of People's Commissars of the USSR introduced the category of state standards (GOST). Since the beginning of the second five-year period and until 1941 8600 GOSTs were developed and approved.

In 1962 the CMEA (Council for Economic Mutual Assistance) Standing Commission for Standardization and the CMEA Institute for Standardization were created, they were engaged in standardization within the CMEA. On June 21, 1974 the CMEA session on its meeting approved the position of the standards of the Council for Mutual Economic Assistance (CMEA ST). CMEA ST, as they are developed, gradually replaced GOST until the collapse of the CMEA in 1991.

Standards adopted before 1996 were legal acts and were therefore mandatory for use in areas that were determined preamble of the standard itself. For documents adopted after 1996, the standardization itself ceased to mean a binding instrument. Currently, the document becomes a binding legal act after the registration in the Ministry of Justice.

In the Russian Federation, the Federal Law on Technical Regulation № 184-FZ dated December 27, 2002 separated the concepts of "technical regulation" and "standard", in connection with what that standards should lose their mandatory nature and be applied voluntarily. Until September 1, 2011, in the period prior to the adaptation of relevant technical regulations, the law provided for compliance with the requirements of the standards, consistent with the purpose of protection of life or health of citizens, property of individuals or legal entities, state or municipal property; environment, life or health of animals and plants; prevention of actions misleading purchasers. Since the 1 of September 2011 all regulations and regulatory documents in the field of technical regulations that were not included in the list of mandatory, became optional (the Federal Law "On Technical Regulation" dated 27.12.2002 №184-FZ).

One of the popular standards classifiers is "Qualifier of state standards of the USSR (Soviet Union Qualifier of state standards. - M: Standards publishing house, 1978. - 51 pages). It is currently used under the name "The Qualifier of state standards" (QSS or KGS). The classifier is strictly hierarchical; it has alphanumeric coding system for three (sometimes four) levels. The first level (section) consists of 19 capital letters of the Russian alphabet, the second (class) and the third (group) levels are digital. The fourth level (subgroup) may be added after a full point.

On the 1 of October 2000 the KGS was replaced by the National Classification of Standards OK 001-2000 (Resolution of the Federal Agency on Technical Regulating and Metrology of Russia dated May 17, 2000 № 138-c.). This classifier is based on the International Classification of standards ISO. However, KGS is still used as the basis of many information retrieval systems for standards. It is also a basic interstate system for the standardization of the CIS countries.

This system still uses the index of standard category GOST (GOST 2.105-95 "Unified system for design documentation. General requirements for text documents"), whereas the standards adopted in Russia use the index of standard category GOST R. Code of the standard consists of the number and the year of approval of the standard, separated by a hyphen. Number mainly determined by the sequence of acceptance or, if it is a systematic family, it contains a code number of a family, full point and an internal family number. For example, the standard number, containing the prefix "2" refers to the Unified system for design documentation (ESKD), "4" – to a system of indicators of quality (SPHP) and so on.

National Classification Standards (NCS) developed by Institute of classification, terminology, data standardization and quality. It has the form of a full text of the International Classification of Standards (ICS), adopted by ISO (the RF Government Resolution dated September 25, 2003 № 594 "On the publication of national standards and national classifications of technical, economic and social information").

NCS is the part of the uniform system of classification and coding of technical, economic and social information (USCC) of the Russian Federation. Classifier is designed for use in the construction of catalogs, indexes, selection lists, bibliographies on international, interstate and national standards and other normative and technical documents.

Objects for NCS classification are the standards and other normative and technical documents.

Qualifier has a form of a three-step hierarchical classification with a digital alphabet code classification of groups and has the following structure: XX.YYY.ZZ, where XX – is a section, YYY - group, ZZ - subgroup. On the first stage (section) the subject areas of standardization are classified, with further division on the second and third stages of the classification (group, subgroup). Section is classified by a two-digit numeric code. Group code is composed of the subject area and a three-digit numeric group code separated by a dot.

Implementation of the Agreement on Partnership and Cooperation between Russia and the EU as well as Russia's accession to WTO significantly increase the importance for the Russian export-oriented enterprises of passing the environmental audit in accordance with international standards.

## References

1. *3x3 good reason for EMAS. Improve your environmental performance with the premium standard in environmental management.* <http://ec.europa.eu/environment/emas> (11.05.14).
2. Accounting for the effects of climate change, hmt & defra june 2009: <http://archive.defra.gov.uk/environment/climate/documents/adaptation-guidance.pdf> (15.06.14).
3. A guide to corporate environmental indicators. Federal Environment Ministry, Bonn, Federal Environmental Agency, Berlin 1997.
4. AK "Immaterielle Werte im Rechnungswesen" der Schmalenbach-Gesellschaft für Betriebswirtschaft e.V. 2005. Corporate reporting on intangibles - A proposal from a german background. Schmalenbach Business Review (Special Issue 2/05): 65-100.
5. AlpEnergy (n.d.) [www.alpenergy.net](http://www.alpenergy.net)
6. Baggio, R. (2014). Complex tourism systems: a visibility graph approach. *Kybernetes*, Vol. 43 Iss: 3/4: 445 – 461.
7. Bebbington, J., Gray, R., Hibbitt, C., Kirk, E. 2001. Full costs accounting: an agenda for action (ACCA Research Report No. 73. London: Certified Accountants Educational Trust, London.
8. Bennett, M., James, P., 1997. Environment-related management accounting current practice and future trends. *Greener Management International*, Business Source Premier, 17: 32-41.
9. Bennett, M., James, P., 1998b. Life cycle costing and packaging at Xerox Ltd. In: Bennett, M., & James, P. (Eds.), *The green bottom line - environmental accounting for management: current practice and future trends*. Sheffield: Greenleaf Publishing.
10. Bennett, M., James, P., 1998a. The Green Bottom line. In: Bennett, M., & James, P. (Eds.). *The green bottom line - environmental accounting for management: current practice and future trends*. Sheffield: Greenleaf Publishing.
11. Berkowitz, Lutterman in Henion, 1968 in 1972 v Vrbič M. (2006) Zeleni marketing: zeleni potrošnik. Diplomsko delo. Ljubljana: Univerza v Ljubljani, Fakulteta za družbene vede.
12. Bjørner, Thomas B., Lars Garn Hansen in Clifford S. Russell (2003) Environmental labeling and consumers' choice- an empirical analysis of the effect of the Nordic Swan. *Journal of Environmental Economics and Management* 47, 2004 (411–434). Pridobljeno iz spletne podatkovne baze Science Direct, 5. 12. 2004.
13. Boyd D E, Spekman R E, Kamauff J W, Werhane P, (2006): Corporate Social Responsibility in Global Supply Chains: A Procedural Justice Perspective, *Long Range Planning*, No. 40, str. 341 – 356.
14. Bundesministerium für Bildung und Forschung. Klimazwei - forschung für den klimaschutz und schutz vor klimawirkungen. 01.06.2008.
15. Bowens, R. (2011). *Understanding the ISO 26000 social responsibility standard and how it relates to and can be assessed alongside other standards*. Global Product Manager, Sustainability Report Assurance, SGS.
16. Burritt, L., Hahn, T., Schaltegger, S., 2001. Current developments in environmental management accounting - towards a comprehensive framework for environmental management accounting (EMA). *Universitaet Lueneburg*.
17. Castka P, Balzarova M A, (2007): ISO 26000 and supply chains – On the diffusion of the social responsibility standard, *International Journal of Production Economics*, No. 111, str. 274 – 286.
18. Chan, Ricky (2004). Consumer responses to environmental advertising in China. *Marketing, Intelligence & Planning*, Vol. 22 No. 4, 2004 (427-437). Emerald Group Publishing Limited.
19. Christopher, M. (1998). *Logistics and Supply Chain Management*. 2. izd. London: Financial Times Professional Limited.

20. Coddington, Walter (1993) Environmental marketing: positive strategies for reaching the green consumer. Združene države Amerike: McGraw-Hill Inc.
21. Commission Decision of 4 March 2013 establishing the user's guide setting out the steps needed to participate in EMAS, under Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).
22. Commoner, B. 1972. The environmental cost of economic growth. In R. G. Ridker (Ed.), Population, resources and the environment: 339-363. Washington, DC.
23. Dispoto 1977 v Vrbič M. (2006) Zeleni marketing: zeleni potrošnik. Diplomsko delo. Ljubljana: Univerza v Ljubljani, Fakulteta za družbene vede.
24. Ditz, D., Ranganathan, J., Banks, R. D. 1998. Green ledgers - an overview. In: Bennett, M. & James, P. (Eds.), The green bottom line - environmental accounting for management: current practice and future trends. Sheffield: Greenleaf Publishing.
25. Dlugolecki, A., & Lafeld, S. 2007. CEO briefing: Carbon crunch - meeting the cost. Paris.
26. Elkington J, (1998): Partnerships from Cannibals with Forks: The Tiple Bottom Line of 21-st Century Business, Environmental Quality Management, Vol. 8, No. 1., str. 37 – 51.
27. EMAS – Factsheet. EMAS benefits. May 2008. [http://ec.europa.eu/environment/emas/pdf/factsheet/fs\\_iso\\_en.pdf](http://ec.europa.eu/environment/emas/pdf/factsheet/fs_iso_en.pdf) (09.07.14).
28. EMAS – Factsheet. EMAS benefits. February 2011. <http://ec.europa.eu/environment/emas> (09.07.14).
29. EMAS – Factsheet. EMAS benefits. May 2008. [http://ec.europa.eu/environment/emas/pdf/factsheet/fs\\_iso\\_en.pdf](http://ec.europa.eu/environment/emas/pdf/factsheet/fs_iso_en.pdf) (09.07.14).
30. EMAS I: Council Regulation (EEC) No 1836/93.
31. EMAS II: Regulation (EC) No 761/2001.
32. *EMAS. Verified Environmental Management. Systematic Environment Management. Creating Added Value with EMAS. The Difference between EMAS and ISO 14001.* Umwelt Gutachter Ausschuss.
33. Envirowise Increase your profits with environmental management accounting. (Envirowise - Practical environmental advice for businesses, 2003, last update).
34. ESCAP-AITD (2001). Sustainable transport pricing and charges: Principles and issues, Technical report, United Nations - Economic and Social Commission for Asia and the Pacific (UN-ESCAP), Asian Institute of Transport Development (AITD). Bangkok, Thailand.
35. Esty, Daniel in Andrew Winston. Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value and Build Competitive Advantage. 1. izdaja. Yale University Press, 9. oktober 2006.
36. Faisal M N, Banwet D K, Shankar R, (2006): Supply chain risk management: modeling the enablers, Business Process Management Journal, Vol. 12, No. 4, str. 535 – 552.
37. Fokus Association for Sustainable Development. Sustainable Mobility. Found 27 August 2013 online: [www.focus-ngo.org](http://www.focus-ngo.org)
38. Günther, E. 1994. Ökologieorientiertes controlling. München.
39. Günther, E., & Wittmann, R. 1995. Kondukte. Die Betriebswirtschaft, 55(1): 119-120.
40. Gürtler, G., Graziani, C. (2010). *ISO 26000 Guidance on social responsibility. ISO 26000 User Guide, 26k-User-Guide.*
41. Gürtler, G. (2011). *ISO 26000 applicability.*
42. *Handbook for Implementers of ISO 26000. Global Guidance Standard on Social Responsibility.* ECOLOGIA. May 2011.
43. Gutenberg, E. 1983. Grundlagen der betriebswirtschaftslehre: Band 1: Die produktion. Berlin.
44. Hahn, T. 2005. Gesellschaftliches engagement von unternehmen. reziproke stakeholder, ökonomische anreize, strategische gestaltungsoptionen. Wiesbaden.
45. Hardin, G. 1968. The tragedy of the commons. Science (162): 1243-1248.

46. Hartmann Patrick, Vanessa A. Ibanez in Javier F. Sainz (2005) Green branding effects on attitude: functional versus emotional positioning strategies. *Marketing Intelligence & Planning* Vol. 23 No. 1, 2005 (9-29). Emerald Group Publishing Limited. Pridobljeno iz spletne podatkovne baze Emerald Fulltext, 15. 3. 2005.
47. [http://en.wikipedia.org/wiki/Sankey\\_diagram](http://en.wikipedia.org/wiki/Sankey_diagram) (18.07.14).
48. <http://recyclemaniacs.org/participate/rules/divisions-categories/waste-minimization> (15.06.14).
49. <http://kn51.ru/news/society/ecology/2013/5/02/ekologiya-kak-indikator-zrelosti-obshchestva.html>
50. [http://ec.europa.eu/environment/emas/about/summary\\_en.htm](http://ec.europa.eu/environment/emas/about/summary_en.htm) (02.06.14).
51. <http://www.iso.org/sites/iso26000launch/documents.html> (25.06.14).
52. <http://ria.ru/danger/20100527/239219525.html>
53. [http://rzd.ru/static/public/ru?STRUCTURE\\_ID=1413](http://rzd.ru/static/public/ru?STRUCTURE_ID=1413)
54. [http://rzd.ru/dbmm/download?col\\_id=121&id=72677&load=y&vp=1#4](http://rzd.ru/dbmm/download?col_id=121&id=72677&load=y&vp=1#4)
55. [http://rzd.ru/dbmm/download?col\\_id=121&id=72677&load=y&vp=1#4](http://rzd.ru/dbmm/download?col_id=121&id=72677&load=y&vp=1#4)
56. <http://the9000store.com/>
57. <http://qualitevolution.blogspot.com/2013/04/excellence-canada-for-canada-iso-9004.html>
58. <http://the9000store.com/what-is-iso-9004.aspx>
59. <http://vietnamwcm.files.wordpress.com/2008/07/iso-9001-2000-quality-management-system-design.pdf>
60. <http://www.praxiom.com/iso-9004-intro.htm>
61. <http://www.praxiom.com/iso-9004-overview.htm>
62. <http://www.qualitydigest.com/inside/twitter-ed/iso-90042009-out-and-it-sure-looks-different.html>
63. <http://www.qualicertus.co.za/benefitsofqualitymanagementsystem.html>
64. <http://www.referenceforbusiness.com/small/Inc-Mail/ISO-9000.html>
65. <http://www.saiglobal.com/training/assurance/quality-management/>
66. <http://www.saiglobal.com/Assurance/quality-business-management/ISO9001.htm>
67. <http://www.iso9001.com/benefitsofiso9001.asp>
68. [http://www.wmo.int/pages/prog/amp/aemp/documents/QM\\_Guide\\_NMHSs\\_V10.pdf](http://www.wmo.int/pages/prog/amp/aemp/documents/QM_Guide_NMHSs_V10.pdf)
69. Ingaldi M. 2013a. Environmental Factors of the Functioning of Small and Medium Companies. In Seroka-Stolka, O. (Eds.), *Współczesne determinanty funkcjonowania małych i średnich przedsiębiorstw*. 13-24. Częstochowa: Sekcja Wydaw. WZ PCzest.
70. Ingaldi, M., 2013b. Waste management in the small and medium companies. In Seroka-Stolka, O. (Eds.), *Współczesne determinanty funkcjonowania małych i średnich przedsiębiorstw*. 24-31. Częstochowa: Sekcja Wydaw. WZ PCzest.
71. Ingaldi, M., Lestyánszka Škúrková, K. (2013). Environmental management in Polish companies. In *Management of Environment 2013. Proceedings of the 13th International Scientific Conference, Rusko M. (Eds.), Bratislava, April 18 - 19, 2013*. 16-19. Žilina: Strix, Edition ESE-14.
72. Ingaldi M., Borkowski S. 2014. Recycling process of the aluminium cans as an element of the sustainable development concept. *Manufacturing Technology*, Vol. 14, No 2: 172-178.
73. International Organization for Standardization [ISO], (2010): Guidance on social responsibility, International Organization for Standardization, Ženeva.
74. IPCC. Klimaänderung 2007: Zusammenfassungen für politische entscheidungsträger - vierter sachstandsbericht des IPCC (AR4). 01.06.2008.
75. ISO 9001:2008 - Quality management systems – Requirements.
76. ISO 26000. social responsibility. ([www.iso.org](http://www.iso.org)).
77. Jaklič A., Svetličič M. (2005) Izhodna internacionalizacija in slovenske multinacionalke. Ljubljana: fakulteta za družbene vede.

78. Jasch, Ch. 2000. Environmental performance evaluation and indicators. *Journal of Cleaner Production*, 8: 79 – 88.
79. Kardas, E., Brožová, S. 2013. Situation in Waste Treatment in Poland. In *METAL 2013. 22nd International Conference on Metallurgy and Materials. Conference Proceedings. May 15th - 17th 2013, Brno, Czech Republic. 1773-1778*. Ostrava: TANGER Ltd.
80. Kassaye, Wossen W. (2001) Green dilemma. *Marketing Intelligence & Planning* 19/6, 2001 (444–455). MCB University Press. Pridobljeno iz spletne podatkovne baze Emerald Fulltext, 23. 1. 2005.
81. Klopčič, Z. (2003). Upravljanje oskrbnih verig. *Monitor*, priloga Sistem, maj 2003. Ljubljana.
82. Knez M., Cedilnik M., Semolič B. (2007). *Logistika in poslovanje logističnih podjetij*. Celje: Fakulteta za logistiko UM.
83. Knez, M. (2013a). *Razvoj trajnostnih oskrbovalnih verig*, Gradivo UN. Celje: Fakulteta za logistiko UM.
84. Knez, M. (2013b). *Zelene tehnologije v logistiki*, Gradivo VS. Celje: Fakulteta za logistiko UM.
85. Kotler, Philip (1998) *Marketing management - trženjsko upravljanje: analiza, načrtovanje, izvajanje in nadzor*. Ljubljana: Slovenska knjiga.
86. Kotus, M., Pauliček, T., Jankaj, D., Spišáková, Ž., Holota, T., Ingaldi, M. (2014). Audit bezpečnosti obrábacieho centra vo výrobnjej organizácii = The safety audit of machining center in the manufacturing organization. *Kvalita, technológie, diagnostika v technických systémoch = Quality, technologies, diagnostics of technical systems*. Ed. Jozef Hrubec a kolektív. *Zborník vedeckých prác. SPU v Nitre*.
87. »La CE propone unificar metodos para medir si un producto o empresa es verde« [comunidad ism], 15 April 2013. Available at: <http://www.comunidadism.es/actualidad/la-comision-europea-propone-unificar-metodos-para-medir-si-un-producto-o-empresa-es-verde>
88. Lambert D., Stock J.R. (1993) *Strategic Logistic Management*. Boston. The MCGRAW HILL Companies Inc. 862 str.
89. Laroche, M., Bergeron, J., Barbaro-Forleo, G. (2001): Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, let. 18, št. 6, 503–520. Dostopno preko podatkovne baze Emerald:<http://www.emeraldinsight.com/10.1108/EUM0000000006155> (25. 1. 2010).
90. Lestyánszka Škúrková, K., Ingaldi, M. (2013). Recycling process of the aluminium cans as an example of the renewable material sources. *Advanced Materials Research*, Vol. 1001: 103-108.
91. Linnenluecke, M. K., Griffiths, A. & Winn, M. I. (2013). Firm and industry adaptation to climate change: a review of climate adaptation studies in the business and management field. *Wiley Interdisciplinary Reviews: Climate Change*. 4(5), 397–416.
92. Lippke, Jim (1994) Green strategies cope with electronic products' energy and end of life. EDN; Nov 10, 1994; ABI/INFORM Global. Pridobljeno iz spletne podatkovne baze EBSCOhost, 13. 6. 2005.
93. Martin in Simintiras, 1995 Bridget M., Simintiras A.C. (1995) The impact of green product lines on the environment: does what they know affect how they feel? *Marketing Intelligence & Planning*, Vol. 13 No.4, 1995 (16-23). MCB University Press Limited. Pridobljeno iz podatkovne baze EBSCOhost, 13.6.2005.
94. [New\\_Folder/Material%20%20balance.pdf](#) (20.07.14).
95. Matthew, H. M. H., Sankey. The thermal efficiency of steam engines. minutes of proceedings of the institution of civil engineers. CXXXIV (1897-1898, Part IV).
96. »Marcas Verdes 2013: Sustentabilidad sobre ruedas« [Strategikas], 18 June 2013. Available at: <http://estrategikas.blogspot.com/2013/06/marcas-verdes-2013-sustentabilidad.html>
97. Meadows, D. H., Randers, J., & Meadows, D. L. 2006. Grenzen des wachstums - das 30-jahre-update. signal zum kurswechsel. Stuttgart.

98. Meadows, D. H., Meadows, D. L., Randers, J. and Behrens, W. W. (1972). *The Limits to Growth*, Universe books, New York, ZDA
99. Meadows, D. H., Meadows, D. L. and Randers, J. (1992). *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future*, Earthscan publications, London, England.
100. Mentzer J T, DeWitt W, Keebler J S, Min S, Nix N W, Smith C D, Zacharia Z G, (2001): Defining supply chain management, *Journal of Business Logistics*, Vol. 22, No. 2, str. 1 – 25.
101. Moon, Wanki, Wojciech J. Florkowski, Bernard Bruckner in Ilona Schonhof (2002) Willingness to pay for environmental practices: Implications for Eco-Labeling. *Land Economics*, februar 2002 (88–102). Pridobljeno iz spletne podatkovne baze EBSCOhost, 10. 2006
102. Muller, Taylor, 1991 v Vrbič M. (2006) *Zeleni marketing: zeleni potrošnik*. Diplomsko delo. Ljubljana: Univerza v Ljubljani, Fakulteta za družbene vede.
103. Müller-Wenk, R. 1978. *Die ökologische buchhaltung: Ein informations- u. steuerungsinstrument für umweltkonforme unternehmenspolitik*. Frankfurt a. M.
104. Oblak, Henrik. 2007. *Mednarodna podjetniška logistika*. Celje: FL.
105. Ogorelc, Anton. 1996. *Logistika, organiziranje in upravljanje logističnih procesov*. Maribor: Ekonomsko Poslovna fakulteta.
106. Ogorelc, A. 2004. *Mednarodni transport in logistika*. Maribor: Ekonomsko-poslovna fakulteta.
107. Ottman, Jacquelyn A. (1997) *Green marketing: opportunity for innovation*. Illinois: NTC Business Books.
108. »Our social pledge« [Carpets Inter], 11 September 2014. Available at: [http://www.carpetsinter.com/en/cmpn/cmpn\\_scl\\_iso.html](http://www.carpetsinter.com/en/cmpn/cmpn_scl_iso.html)
109. Palmer, A. J. (1996) *Integrating brand development and relationship marketing*. *Journal of Retailing and consumer services*, vol 3. No 4. (251–257), 1996 Elsevier Science Ltd. Pridobljeno iz spletne podatkovne baze Emerald Fulltext, 8. 7. 2005.
110. Pigou, A. C. 1932. *The economics of welfare*. London.
111. Peattie, Ken (1995) *Environmental marketing management: meeting the green challenge*. London: Pitman.
112. Pochyluk, R., Grudowski, P., Szymański, J. 1999. *Zasady wdrażania systemu zarządzania środowiskowego zgodnego z wymaganiami normy ISO 14001*. Gdańsk: Ekokonsult.
113. Pochyluk, R., Szymański, J. 1999b. *Ocena efektywności działań środowiskowych i benchmarking – zastosowanie normy ISO 14031*. *Problemy Ocen Środowiskowych*, 3.
114. *Premium environmental management. EU Eco-management and audit scheme*. <http://ec.europa.eu/environment/emas> (17.05.14).
115. Potočnik, Vekoslav. 2002. *Nabavno poslovanje s primeri iz prakse*. Ljubljana: Ekonomska fakulteta.
116. *Premium environmental management. EU Eco-management and audit scheme*. <http://ec.europa.eu/environment/emas> (17.05.14).
117. »Product LCAs and EPDs« [Coldstream consulting], n.d. Available at: <http://www.coldstreamconsulting.com/services/product-lcas-and-epds>
118. *Quick refrence to material flow cost accounting (ISO 14051)*. National Productivity Council. <http://www.npcgandhinagar.in/pdf/Presentation/MFCA%20Guide%20Book.pdf> (23.07.14).
119. Radonjič, G. (2012). *Načrtovanje okolju primernejših proizvodov (ekodizajn) v slovenskih proizvodnih podjetjih*, elaborat. Maribor: Univerza v Mariboru, Ekonomsko – poslovna fakulteta.
120. Regulation (EC) No 1221/2009 Of The European Parliament And Of The Council. of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC.
121. Rosi, B. (2008). *Ali ste pripravljeni dialektično omrežno razmišljati*, RoBo, s.p., Maribor.
122. Rosi, Bojan in Marjan Sternad. 2007. *Prometni sistemi*. Celje: FL.

123. Rozporządzenie (WE) Nr 761/2001 Parlamentu Europejskiego i Rady z dnia 19 marca 2001 r. dopuszczające dobrowolny udział organizacji w systemie eko-zarządzania i audytu we Wspólnocie (EMAS).
124. Ryszko., A. 2003. Ocena cyklu życia jako narzędzie wspomagające rozwój produktu. Organizacja i Zarządzanie Zeszyt Piętnasty, Zeszyty Naukowe Politechniki Śląskiej, Gliwice: Wydawnictwo Politechniki Śląskiej.
125. Sandahl in Robertson, 1989 v Vrbič M. (2006) Zeleni marketing: zeleni potrošnik. Diplomsko delo. Ljubljana: Univerza v Ljubljani, Fakulteta za družbene vede.
126. Schahn, Holzer, 1990 v Vrbič M. (2006) Zeleni marketing: zeleni potrošnik. Diplomsko delo. Ljubljana: Univerza v Ljubljani, Fakulteta za družbene vede.
127. Siebenhüner, B. 2001. Homo sustinens – auf dem weg zu einem menschenbild der nachhaltigkeit. Marburg.
128. Simon, H. A. 1955. A behavioral model of rational choice. Quarterly Journal of Economics, 69(1): 99-118.
129. Smith, A. 1999. Der wohlstand der nationen. München.
130. Spence L, Bourlakis M, (2009): The evolution from corporate social responsibility to supply chain responsibility: the case of Waitrose, Supply Chain Management: An International Journal, Vol. 14, No. 4, str. 291 – 302.
131. Steele R. *ISO Secretary-General. ISO 26000. Social responsibility. The launching of a dream.*
132. Stewart G, (1995): Supply chain performance benchmarking study reveals keys to supply chain excellence, Logistics Information Management, Vol. 8, No. 2, str. 38-44.
133. Strong, Caroline (1996) Features contributing to growth of ethical consumerism – a preliminary investigation. Marketing Intelligence & Planning 14/5, 1996 (5-13). MCB University Press. Pridobljeno iz spletne podatkovne baze Science Direct, 10. 1. 2005.
134. *Study on the costs and benefits of EMAS to registered organisations. Final Report.* Study Contract No. 07.0307/2008/517800/ETU/G.2. October 2009. Milieu Ltd. (11.07.14).
135. The big EMAS revision. The European Eco-management and audit scheme. [http://ec.europa.eu/environment/index\\_en.htm](http://ec.europa.eu/environment/index_en.htm) (03.07.14).
136. Thorensen J. 1999. Environmental performance evaluation – a tool for industrial improvement. Journal of Cleaner Production, 7: 365-370.
137. »Triple Bottom Line Approach: People, Planet, Profit« [Basis Bay, Reingeneering IT], 20 September 2014. Available at: <http://www.basisbay.com/About-Us/Column-3/Corporate-Social-Responsibility/Triple-Bottom-Line-Approach.aspx>
138. Ule, M. & Kline, M. (1996) Psihologija tržnega komuniciranja. Ljubljana: Fakulteta za družbene vede.
139. Umweltbundesamt. Anpassung an klimaänderungen in deutschland – regionale szenarien und nationale aufgaben. 01.06.2008.
140. Umweltbundesamt. Neue ergebnisse zu regionalen klimaänderungen. das statistische regionalisierungsmodell WETTREG. 01.06.2008.
141. UNCED (1992). Agenda 21, Technical report, United Nations Conference on Environment & Development (UNCED), Rio de Janeiro, Brazil.
142. UNDSO - United Nations Division for Sustainable Development, Environmental Management Accounting Procedures and Principles (EMARIC Environmental Management Accounting Research and Information Center, 2003).
143. WCED (1987). Our Common Future, World Commission on Environment and Development (WCED), Oxford, England.
144. [www.iso.org/iso/home/standards/management-standards/iso\\_9000.htm](http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm)
145. [www.isoeasy.org](http://www.isoeasy.org)
146. [www.pjr.com/standards/iso-90012008/benefits-of-iso-9000](http://www.pjr.com/standards/iso-90012008/benefits-of-iso-9000)
147. [www.public.iastate.edu/~vardeman/IE361/f00mini/de-almeida-gunaman-nurre.pdf](http://www.public.iastate.edu/~vardeman/IE361/f00mini/de-almeida-gunaman-nurre.pdf)
148. Zadek, Simon, Sanjiv Lingajah in Maja Forstater (1998) Social Labels: Tools for Ethical Trade Final report. New Economics Foundation for the European Commission, European

Commission: Directorate-General for Employment, Industrial Relations and Social Affairs  
Directorate V/D.1

149. Zupančič, Samo. 1998. Ekonomika transporta. Ljubljana: Ekonomska fakulteta.

## REVIEWS

## Review

Scientific monograph entitled “Environmental management & audit“ is the result of Tempus Lifelong learning project RECOAUD. The monograph transparently represents some issues and challenges of environmental management, which tries to respond to climate change and ecological scarcity. The monograph unites contributions from European and Russian scientists from different scientific areas, thus it provides more holistic approach to the same thematic. The monograph should therefore reach especially wide target group of readers, as they can be recognized in students, experts from industry as well as in teachers.

The reader of the monograph gets a comprehensive overview and presentation of environmental management and audit at the theoretical level in the considered specific areas. In the monograph the results of research in the field of environmental management and audit, as well as trends and challenges in the development of this field are highlighted.

Monograph “Environmental management & audit“ consists of 4 books – Scarcity and Introduction of Environmental Management, Management Systems, Controlling and Stakeholders, and Environmental Assessment (Featured Articles). These topics represent the complexity, heterogeneity and multidisciplinary of the project Tempus RECOAUD.

In terms of the content, structure and the holistic approach from diverse international group of authors to this monograph, I conclude that the monograph completely fulfills the preconditions for a scientific monograph, thus it deserves to be published by the International publisher SPH.

Reviewer:  
**BAGRAT YERZNAKYAN**  
Dr., prof., head of lab.,  
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## Review

This scientific monograph "Environmental management & audit" is the result of three-year work on an international project entitled "Environmental management in Russian companies – retraining courses for the sensibilization for and integration of Eco-Audit programs in corporate decision-making (RECOAUD)". It contains more than 600 pages of interesting text written by 31 authors from EU and Russian Federation, edited by dr. Borut Jereb, Darja Kukovič and dr. Daria Meyr.

The monograph is well structured and contains different forms of content – whether it is formed as chapters and subchapters or as articles, which has been written on a high level of methodological and research standards.

In the first part of the monograph, Scarcity, the Framework of Environmental management and Environment management systems are represented. Second part represents Supply chain and Value chain Management, Logistics and Transport with Case studies at the end. The third part talks about Controlling and Stakeholders. The last part contains featured articles on Environmental assessment issues.

The monograph is the result of successful scientific and inter-faculty cooperation. It is useful for those who engage in the field of environmental management and audit in science and practice, or it can be used for study purposes. Thus, the contents of monographs meets the conditions for a scientific monograph, therefore I recommend it to be published.

Reviewer:  
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