

# **Content of Environmental Component of Sustainable Development in the Enterprise Activity**

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**Abstract.** In order to build a sustainable society it is necessary to reconcile the desire to improve the quality of life with the global eco-system limits. Enterprises aiming for sustainable development must combine economic interests with environmental needs and take all possible measures to protect the environment. It has been recently observed that environmental measures are cost-efficient, as they allow to reduce the raw materials consumption and increase energy efficiency. The aim of this article is to analyse the content of environmental component of sustainable development in scientific research and identify composition of this component based on enterprises experience. The research was carried out using analysis of scientific literature and synthesis of various approaches. Analysis of enterprises reports in Global Compact Network and identification of indicators shows that increase or reduction limit accessibility would allow companies to achieve sustainable development in the environmental field.

**Keywords:** environmental component of sustainable development, environment, ecosystem, product life cycle, stakeholders, integrated management system.

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## **1. Introduction**

In the history of humankind the human-nature relationship is of major importance. Accordingly, environmental factors affect social development. In

the past decades all humans represented a major concern for environmental protection. A continuous impact of humans on the environment is obvious. Harmful effects of environmental pollution have become an issue of serious concern showing that economic development might have negative environmental consequences for our future generations. These particular consequences determined the emergence of the concept of sustainable development (Paul et al. 2014). Sustainable development - a compromise between economic growth and environmental protection, which is considered as a strong relationship between economic development and environmental quality (Kriščiūnas et al. 2007). When enterprises seek higher profits for lower costs they usually do not consider that their activity might cause negative effects to ecosystems. As noted by D. Barbien (2013) and Paul et al. (2014), consequences are apparent: natural resources are becoming scarce, the environment is getting worse (the increase in air and water pollution and the ozone layer depletion, the increasing atmospheric concentration of carbon dioxide and the amount of wastes); this causes diseases and the quality of life reduces. According to K. Genc (2013), environmental protection and the enterprise activity results are closely related to each other. It is observed in cases when environmental protection is oriented towards satisfying customer expectations, which is related to environment-friendly products and services.

The aim of European industries is to move towards low-carbon technologies and resource-efficient economy until 2050. In order to ensure economic growth and the workplace creation it is necessary to approach towards the knowledge-based and innovative technologies as well as higher value-added industries and services that would be innovative, competitive and more sustainable. Inter-relationship between services and production is widely acknowledged, since industrial activities cover more and more services, whereas the majority of services depends on results of the industrial sectors activity (COM 2014).

Environment is becoming a key concern for today's specialists, which should obviously be increasing in the future, since it is vary from economic and social components of sustainable development (Staniūnas 2013). Environmental protection challenges are of global significance, therefore all the measures that help overcome these challenges are of utmost importance not merely at the enterprise level but they become important for the country or region (European Commission 2014).

Research object – the content of environmental component of sustainable development.

Research objective - to analyse the content of environmental component of

sustainable development and discern the composition of this component considering a real enterprise experience.

Research methods - a systematic analysis of scientific literature and the synthesis of various approaches based on logical abstraction, comparative analysis of annual statements.

The article deals with the relevance of environmental component of sustainable development and its indications in the enterprise activity, the environmental integration into the enterprise strategy and its management system. Sustainability assessment requires data, which can be gathered from different sources. Annual statements are one of data source which company use to communicate with stakeholders. After analysing the environmental indicators of the Global Compact Network enterprises a list of indicators was made, the increase or reduction limit accessibility of which would enable enterprises to gain sustainable development in the sphere of environmental.

## **2. The relationship between business and the environment**

As noted by K. Y. Genc (2013), the relationship between business and the environment is very strong. Economic system is fully dependent on ecosystems (Barbien 2013). Environmental problems are systematic; therefore they should be solved through a systematic approach that determines the relationship of the impact of human activity on the environment and ecological processes. Production processes use natural resources, whereas the environment is polluted by different types of waste materials (Barbien 2013, Ruževičius 2011). Limited natural resources and the improper disposal of numerous waste materials - two spheres that are of utmost importance to scientists. Contemporary industries and the society use natural resources and produce waste materials, which exceed the nature's ability to absorb such pollutants and turn them back to useful resources. According to Linke et al. (2011), sustainability could be discussed only in the context of a closed system. The natural resources existing on the Earth are limited. The more types of different waste materials are within a limited system, the less high quality materials, which can be used in the future, remain. If waste materials are not decomposed completely, they become harmful to the ecosystem. The amount of energy is limited as well. Currently, the primary source of energy is the sun, which is converted through photosynthesis into chemical energy or accumulates it in the atmosphere in the form of heat (Kriščiūnas et al. 2007). As stated by D. Barbien (2013), the following five

elements are essential for life: water, soil, air, ozone layer and the sun. Business activities affect the environment and have a negative impact on these elements (Barbien 2013). According to Kshatri N. and Chouksey A. (2014), when analysing the impact of the enterprise activity on the environment it should be considered the quality of air, soil and water as well as the preservation of biological diversity. However, a sustainable system is based on resources, which should not expire within a certain period of time, while unacceptable pollutants should not be generated neither internally nor externally (Čiegis et al. 2010). On the other hand, negative impacts of the enterprise activity on the environment should be the issue of stakeholders concerned. The stakeholders are legitimate partners of the enterprise, therefore the enterprise should assess the impact of its own activities on employees, clients, the society, competitors, associations and trade-unions. The objective of the enterprise - to consider the needs of stakeholders concerned and satisfy their expectations. The stakeholders concerned should admit that the policy on environmental protection in a long-term perspective is undoubtedly beneficial, since it increases the enterprise profit when gradually increasing the shares and the value of the enterprise (Genc 2013).

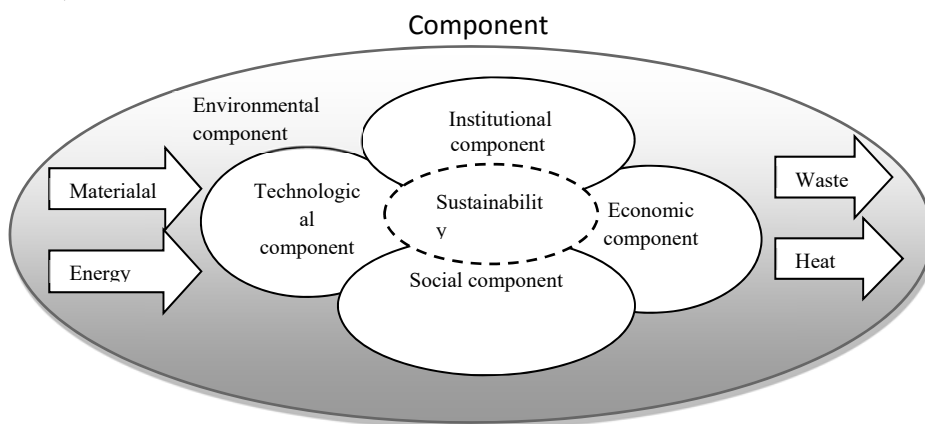


Fig. 1. The relationship between components of a sustainable enterprise (composed by the authors)

As stated by D. Oželienė and R. Drejeris (2014), a sustainable enterprise is a business strategy, which reflects the relationship between the following components: environmental, economic, social, institutional and technological components. The component of environmental is of major importance, since it guarantees successful existence of the four previous components. Figure 1 illustrates the relationship between the components of a sustainable enterprise.

The enterprise activity might be successful only if it receives the required amount of resources and energy. However, the environment is polluted by waste materials, emissions and heat that are caused by the enterprise activity. The environment has a unique feature, which enables it to turn waste materials back to useful resources; however, this process can not exceed the limits of the Earth power. This demonstrates the dependency of the economic system on ecosystem and the importance of environmental component.

### **3. Analysis of the content of environmental component**

The natural environment is one of elements of the business world, therefore enterprises must take care of the environment and protect it as well as use its resources more productively. Environment is the compatibility of the enterprise activity with the aim to preserve biological diversity and ecosystems, the effective and responsible usage of resources (energy, production materials, etc.) in the enterprise activity, environmental protection and revitalization of desolated territories through developing the enterprise activity, the creation and production of products suitable for recycling and consuming less resources in production processes as well as fostering the reduction of power consumption (Genc 2013). Considering the gained experiences, focus of enterprises on the environment should be of three levels: compliance with the operating regulations, readiness to guarantee the tightening enforcement of regulations and the development of the environmental protection - oriented thinking (Ruževičius 2011). For the enterprises, seeking sustainable development, it is not enough to comply with the acknowledged regulations or look forward to new laws; it is necessary to review and assess all the products manufactured and services provided when bearing in mind environmental protection. According to Paul et al. (2014), environmental protection in the enterprise activity might be oriented towards products or processes. A product-centred approach ensures the quality and protects the enterprise against the image of the enterprise producing non environmentally friendly products. The emphasis laid on processes covers the reduction of waste materials and the implementation of environmental protection technologies aimed at preventing pollutants. These two components help the enterprise comply with the specified requirements and avoid taxes. K. Y. Genc (2013) discerns several trends that demonstrate how environmental protection is identified in the enterprise activity (Fig. 2)

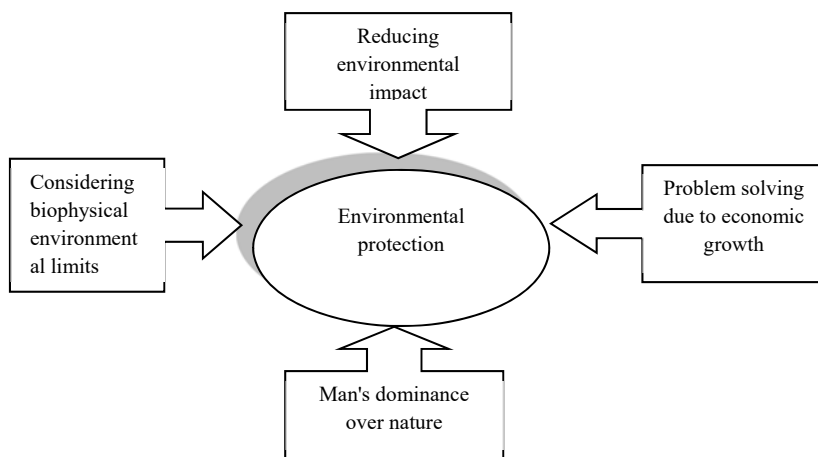


Fig. 2. Environmental protection trends in the enterprise activity (composed by the authors according to Genc 2013)

The first trend - reduction of the environmental impact (Corporate Environmental Orientation) is the reduction of negative effects on the environment to the lowest possible level. This could help enterprises gain a competitive advantage, strengthen the enterprise image and establish a close relationship with customers and clients as well as strengthen the relationship between the enterprise and society. If customer expectations are met when supplying them with eco- friendly products and reducing waste packaging materials due to using ecological materials this would enable enterprises to reinforce their positions in the market. The reduction of waste materials would increase the efficiency of the enterprise activity. And vice versa, non efficient usage of resources would directly or indirectly affect the enterprise activity and it's position in the market. The origins of the second trend are related to the industrial revolution, when man thought to have dominance over nature (Technocentric Paradigm) whereas a rapid economic growth as well as the development of science and technology can not solve all the problems regarding environmental protection (Genc 2013). The increasing pollution and the amount of waste materials confirm that science and technology can not solve the arising problems. Man's dominance over nature is impossible (Ecocentric Paradigm), since there are "the limits to growth", which can not exceed the possibilities of the Earth power – the third trend. The fourth trend - (Sustaincentric Paradigm) admits that priority should be given to "the zero growth", i.e., considering biophysical environmental limits (Genc 2013). According to D. Barbien (2013),

economics can not grow when using limited economic resources. The impossible compatibility between the production development and the increase in the quality of the environment was denied by K. Kriščiūnas et al. 2007. This could be achieved by applying a systematic approach, which analyses the production system as part of the entire environment, whereas the reduction of waste materials, cleaner production and technology as well as the environmental management of enterprises cover the processes beginning with the raw material production and finishing with the final production consumption (Kriščiūnas et al. 2007). Rudzkienė and Burinskienė (2007) admit that the efficiency of economic system is determined by the amount of energy consumption in the production process. The energy balance describes the energy resources, their production, import, export, changes in resources, the consumption of energy resources for producing electric energy and heat, converting it into other fuels, for non - energy purposes, transportation and distribution losses and expenditures (Rudzkienė, Burinskienė 2007). During the production process the environment is polluted by large quantities of pollutants and substances causing the Greenhouse Effect (Ruževičius 2011). As noted by S. L. Hart (1995), pollution can be reduced in two ways: control and prevention. Control can be implemented when preventing the spew of waste materials into the air, water and soil, by using cleaner technologies and less hazardous materials. In case the before mentioned preventive measures are ineffective, the prevention is applied when seeking to reduce pollution at a minimum, which ensures a high level of environmental protection. Prevention of natural resources is also carried out through recycling products and reusing them (Hart 1995). Therefore, pollution is reduced in the pollution occurrence place i.e., in the production process through preventing pollution causes and modifying technological process, its organization, technological modes, raw materials and the product itself. This is aimed at reducing the product's negative impact on the environment during the entire product cycle, whereas pollution and the environment are considered as an integral part of manufacturing process (Kriščiūnas et al. 2007). Pollution can be reduced by cooperating with various industrial units, in the process of which the waste materials of one producer are turned to the raw materials of other enterprises. The product management, which covers the product creation and development processes, is of equal importance. As stated by S. L. Hart (1995), the essence of product management is to reduce the amount of non renewable materials and products, to stop using toxic materials and give priority to renewable materials, to encourage the usage of materials that have less negative effects on the environment, multi-purpose

materials or recycled materials (Hart 1995). Nowadays, manufacturing companies must follow the all new technology and tools for efficiently and effectively to present themselves a good competitor in the global economy. Lean manufacturing is the basic techniques for improve the production rate with the minimum available resources (Nallusamy et al. 2015). According to T. S. Creel (2010), environmental protection can be implemented in the enterprise when involving the enterprise strategy and its management systems as well as implementing and observing international standards.

Therefore, it should be admitted that environmental protection measures should cover the entire chain from the raw material obtaining to the product recycling, which minimizes production costs and maintains sustainable development.

#### **4. The inclusion of environmental protection into the enterprise strategy**

The strategy covers setting the goals, forecasting the measures to pursue them and resources required to implement them. The lack of strategic thinking prevents enterprises from seeking sustainable development. When any work is performed in a strategic manner, all individual activities serve a common purpose, common for the whole set of the activities in this work. All actors and their actions contribute to a common vision, an overall goal. The actors and their activities do not go in different directions, nor are they competing (Baumgartner, Korhonen 2010). Environmental protection is an essential component of the enterprise business strategy. The process, beginning with the product creation, efficient energy consumption and the reduction of greenhouse gas emission and finishing with reducing the waste generation, is becoming important for business. On the other hand, enterprises have the right to choose whether to incorporate environmental protection into the business strategy or not (Creel 2010). The integration of environmental protection and economic measures provides new opportunities, however, enterprises can implement environmental protection components into the business strategy only through close cooperation with the groups concerned, which initiate ecological measures. This is related to the competence and entrepreneurial skills of the owners or founders of the enterprise and reflects the enterprise values and changes in its organizational philosophy and culture (Genc 2013). The integration of environmental protection into the enterprise strategy shows that enterprises choose sustainable development measures that strengthen the enterprise



competitiveness, provide new opportunities and foster the creation of technologies that are less hazardous to the environment. It is usually considered that sustainable development does imply absolute limits. In fact, it means setting the limits when bearing in mind the current level of technology and resources as well as considering the biosphere's capacity to absorb the effects of human activities (Petrovic, Slovic, Cirovic 2012). Sustainable development helps maintain the balance between man and nature and makes the world safer for all living creatures. Sustainable development highlights long-term objectives and obligations for environment (Genc 2013).

## **5. Integration of environmental protection into the enterprise management system**

Management systems help create the added value of an organization (Šimanskienė, Paužuolienė 2012). According to K. Kriščiūnas et al. (2007), the integration of environmental component into the enterprise management system is based on the following principles:

- Material flows in economic, environmental, production and consumption sectors are inter-related.
- The beginning and the end of material flows is considered as a natural environment. At the end of the process the material becomes in appropriate to human needs and is returned to the natural environment.
- From the beginning of material flows to their final stages numerous changes occur, which separately require energy and materials. As a result, this generates waste materials and emissions that cause problems of environmental protection.

On the basis of these principles, the scheme of production processes is provided in Figure 3. Raw materials turn into products, the rest part - into waste materials. Part of waste materials, the used products, can be recycled. As noted by David A. Dornfeld et al. (2013), materials and energy are necessary for production processes, whereas waste materials and pollutants are the results of those processes. However, waste materials can become raw materials for other industrial or natural systems, which positively impact the environment and economics (Dornfeld et al. 2013).

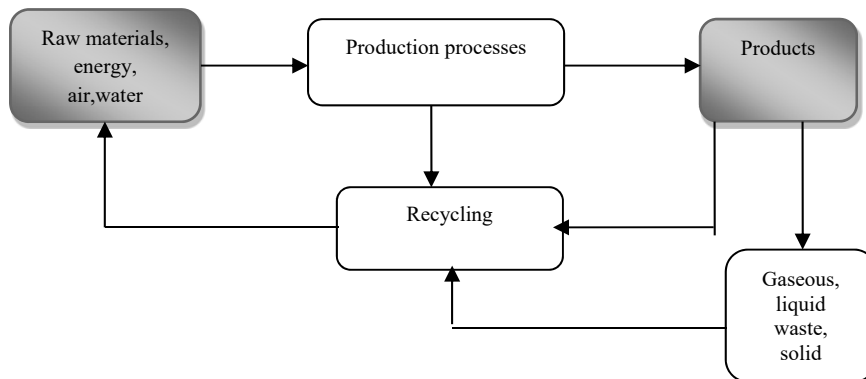


Fig. 3. Production processes (composed by the authors)

Production chains of enterprises can be different and cover numerous branches. However, environmental protection is affected by raw materials, products and recycling, which enables to reduce the amount of waste materials and efficiently use raw materials. In order to gain ecological independence and reduce the impact on the environment enterprises repeatedly recycle the used products. This is important to producers who use large amounts of energy in the production process (Paul et al. 2014). Environmental protection is tightly regulated at the state and enterprise level. Legal acts and regulations specify how enterprises should observe them. Currently, there are two significant types of environmental accountability; mandatory requirements where the corporations must comply with applicable governmental laws and regulations, and voluntary initiatives as an integral part of social responsibilities (Seetharaman et al. 2010). We are not going to analyse them in this particular article, since this does not guarantee a desirable result. When seeking for sustainable development the activities of an enterprise, carried out voluntarily, are of major importance.

Environmental protection in the enterprise is regulated under the provided standards (Xiaolin, Yongmei 2014). Establishing and observing the standards of environmental protection is a voluntary activity (Creel 2010). The standard is a management tool that enables the enterprise to handle the impact of its activity, production and services on the environment. The system of environmental protection is based on the principle, which states that the enterprise must measure, control and assess the efficiency of its own environmental protection.

The standard establishing enterprise demonstrates to the stakeholders concerned that it actively reduces negative impacts caused by its processes, products and services. ISO 14000 family of standards supplies enterprises with management tools for evaluating the aspects and efficiency regarding its own environmental protection and provides economic benefits: reduces the cost of raw materials and energy consumption as well as waste generation and disposal costs. According to ISO 14000 standards, the major requirement for the efficiency of environmental protection is being in compliance with legal requirements for environmental protection, their regular improvement and the pollution prevention. International standards help us perceive the provided criteria in the same way and align them, therefore management systems help create the added value of the enterprise (Šimanskienė, Paužulienė 2012). Standards on management practices, such as ISO 14001, are focused on the implementation of control systems (Zdanyte, Neverauskas 2014). L. Kinderytė (2013) composed a system of sustainable development on the basis of quality standards (ISO 9001), the environmental protection management (ISO 14001), occupational safety and health of employees (OHSAS 18001), social responsibility (SA 8000) and Eco-Management and Audit Scheme (EMAS). The principles for the improvement of sustainable development management ISO 26000 (2009) are not certified, however, one of the seven areas of social responsibility is environmental protection. ISO 26000 submits recommendations to organizations, which is considered as a social responsibility to integrate them into the enterprise activity (Durdevič et al. 2013, Kinderytė 2013).

One of the ways of integrating the environmental protection into the management system of the enterprise is the product life cycle assessment (Life Cycle Assessment). This is a holistic approach towards the relationship between the enterprise and environmental protection, which heeds on production costs and the final product (Genc 2013). Silcher et al. (2013) admits that Life Cycle Assessment helps enterprises solve environmental protection problems, manage complex production systems and control the processes within the systems (Silcher et al. 2013). According to K. Navickas and K. Venslauskas (2012), Life Cycle Assessment is applied to identify and assess environmental aspects and potential effects related to products and services. Environmental effects are measured in various product life stages when assessing material and energy costs, emissions, waste water, the amount of waste materials, the product packaging and transportation. Life Cycle Assessment shows in which stages of the product life cycle it impacts the environment to the greatest extent. This is a holistic approach towards the product, which assesses its impact on the

environment, beginning with the raw material obtaining, transportation and production and finishing with the waste material handling (Navickas, Venslauskas 2012). Environmentally conscious consumers and environmental demands motivate the company to develop environmental knowledge regarding market perspectives, product project and production process development, and updated product launching. Product use and its consequent disposal generate two flows: materials, to be reused or recycled during the manufacturing phase and the analysis of the environmental consequences of each phase, supplying better knowledge of how the product can become more environmentally friendly (Charbel, Chiappetta 2010). Zhu Xiaolin, Guan Yongmei (2014) identified the relationship between the environmental protection management and Life Cycle Assessment based on 3R model (Reduce, Recycle, Reuse), which is provided in Figure 4.

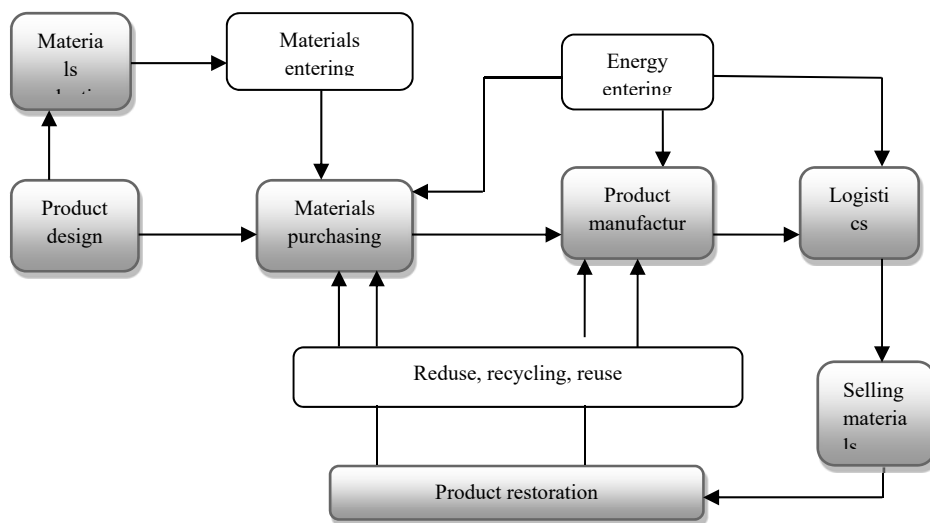


Fig. 4. Environmental protection management of the enterprise is based on the product life cycle (Xiaolin, Yongmei 2014)

3R model aims at minimizing production costs and maximizing recycling and reuse opportunities. This helps avoid environmental protection problems. Production depends on material and energy flows. In case the enterprise is developing its production and consumption, the demand for materials and the energy are increasing respectively. The way out – to organize its production so that waste materials would be returned into the production process as the source of raw materials or energy and would replace non renewable natural resources.

Materials purchasing includes choosing suppliers on the basis of the Requirements for Green Procurement. The basis of product manufacturing - cleaner production – is considered a responsible production covering all the stages of production process and impacting the environment (zero waste), which is closely related to the resource utilization. Advanced logistics covers transportation planning, loading-unloading, storage, packaging and distribution processes. Selling products - "green" marketing - highlights the product benefits related to environmental protection and energy savings. The product restoration is considered as turning a traditional model "raw materials - product - consumption - waste materials" into "resources - product - consumption – resources“ (Xiaolin, Yongmei 2014).

In summary, it should be admitted that the integration of environmental protection into the management system of the enterprise enables to efficiently use resources and reduce waste materials and their handling costs, prepares the enterprise for the tightening legal requirements as well as improves working conditions and relations with the stakeholders concerned.

## **6. Research Findings**

There are a number of ways to inform the society on the enterprise activities and the achieved results in the sphere of environmental protection (Farooque, Ahulu 2015). One of them is the Global Compact – the world's largest voluntary enterprise/corporate social responsibility initiative pursuing two major objectives:

1. To help the enterprise implement the principles of "the Global Compact" into the enterprise strategy.
2. To encourage cooperation and partnership between different sectors within or outside the country when seeking for universal objectives of global development.

The Global Compact is based on the principles of human rights, the labour force framework and environmental protection specified under the following international documents:

- the Universal Declaration of Human Rights;
- the International Declaration of Labour Organization on major principles and rights in the workplace;
- Rio de Janeiro Declaration on Environment and Development;
- the United Nations Convention against Corruption.

Currently, it covers 8000 companies and 4000 business organizations from 134 countries and 19 business sectors. (Global Compact Network 2015). This

network covers 67 Lithuanian enterprises. 17 large companies, 19 small and medium sized enterprises and 17 sectors. The rest of the enterprises belong to the public sector, associations, non-governmental organizations and the academic sector. In this section, the article will be analysing only large companies as well as small and medium sized enterprises, in total - 36 companies, 30 of which are active. Analysis was aimed at to comparing the reports of enterprises of China, India, Brazil, Denmark and the USA. Table 1 provides the characteristics of enterprises selected for the research.

Table 1. Characteristics of enterprises selected by country (composed by the authors)

Name of the country	Total number of enterprises	Number of small and medium sized enterprises			Number of large companies		
		Total	Active	Percentage	Total	Active	Percentage
Lithuania	69	19	16	84	17	14	82
China	270	74	48	65	113	85	75
India	316	47	32	68	77	64	83
Brazil	708	219	155	71	216	188	87
Denmark	315	160	145	91	117	115	98
USA	568	183	138	75	129	122	95

As it is evident from Table 1, in the category of small and medium sized enterprises the most active (providing regular activity reports) are Danish enterprises. The least active - Chinese enterprises. In the category of large companies, the most active are also Danish companies, the least active - Chinese companies. Over the past two to three decades, Denmark has undergone a series of environmental regulations affecting industrial activities. This implies, that the Danish firms have had many years to adapt to the situation and that a growing body of green management (Ulhoi, Madsen 2013). The activeness of Lithuanian enterprises amounts to 84 and 82 percent, respectively. When compared to other countries, Lithuanian small and medium sized enterprises are more active than large companies.

Figure 5 provides the generalized research results, when highlighting the four trends of environmental protection and their respective indicators.

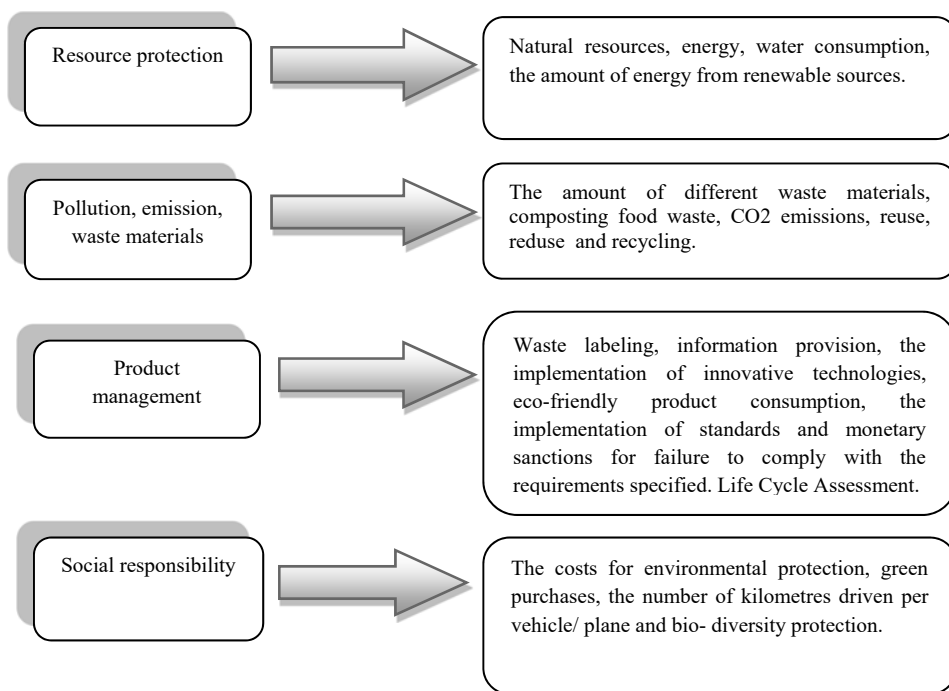


Fig. 5. Trends and indicators of environmental protection (composed by the authors)

Natural resources are significant to those enterprises, which greatly impact the environment due to the nature of their production activities or the manufactured products and provided services. It is important to assess the amount of resources consumed and the scope of environmental impacts. Climate change and actions for reducing the risks of climate change are of major importance to the enterprises of any type regardless of their size and sectors. The enterprise, which aims at sustainable development, should exploit all possible opportunities regarding the consumption, supply and production of energy from renewable sources. The employee awareness of global environmental protection problems, their relations with branches of industry, sustainable production, consumption, supply and the product life cycle will help them implement the enterprise's goals. Enterprises should be concerned with the reduction of internal pollutants in their major activities when decreasing CO2 emissions in external activities (e.g., by registering the number of kilometres driven per vehicle). Waste should not be thrown a way directly to the landfill; it should be disposed responsibly or recycled so that it could be used again. The reduction of waste and the implementation of innovative and modern

technologies should be carried out in the production processes. Waste recycling is of utmost importance in reducing negative effects on the environment. Standardization provides "common understanding" in the enterprise activities and their cooperation when coping with the environmental protection challenges of global significance. The awareness of enterprises and their desire to continually improve the quality of their services and products when seeking to respond to customer expectations and exploit new market opportunities help them seek for sustainable development.

## **7. Conclusions**

The economic system is fully dependent on ecosystems. The enterprise activity depends on continuous material and energy flows. The enterprise growth increases the material and energy consumption, therefore, environmental protection becomes of major importance and is considered one of the four components of sustainable development of the enterprise. In order to achieve sustainable development, it is necessary that production processes should not be finished with the waste generated in these processes but centred on how waste could be turned back into the initial phase and used again as resources. The decrease in resources decreases the overall costs, which results in higher profits.

The integration of environmental component into the enterprise management system can be achieved through assessing the product life cycle and implementing the International ISO 14001 Group Standards, which help assess the quantitative amount of the environmental burden impact related to the products/services and environmental protection benefits as well as forecasting the areas for improvement when considering the total product life cycle. The standard establishing enterprise demonstrates to the parties concerned that it actively reduces the negative impact of its processes, products and services and improves the enterprise's image and its brand value.

In order to pursue sustainable development, enterprises should not limit themselves to the implementation of environmental protection programmes of their own according to the requirements specified under the government but should also take voluntary social responsibility initiatives. These are the major initiatives: joining the Global Compact website and being obligated to provide reports to the public on their own enterprise activity, based on the principles regarding human rights, the labour force and environmental protection approved under the international documents.

The provided research showed that regardless of the nature of the country or enterprise activity, the reports that publicly announce and analyse similar



environmental protection trends can be divided into these four groups: resource protection, pollution, emission and waste, product management and social responsibility.

In the course of the research performance, major trends were identified, the increase or decrease achievable limits of which might enable the enterprise to gain sustainable development in the sphere of environment.

## **References**

Barbien, D. 2013. What makes an enterprise sustainable?, University of Erlangen – Nuremberg Information systems 1: 38–46.

Baumgartner, R. J.; Korhonen, J. 2010. Strategic Thinking for Sustainable Development, Sustainable Development 18: 71–75, Published online in Wiley InterScience [www.interscience.wiley.com](http://www.interscience.wiley.com).

Charbel, J.; Chiappetta, J. 2010. In the eye of the storm: exploring the introduction of environmental issues in the production function in Brazilian companies, International Journal of Production Research. 48(21): 6315–6339.

Creel, S.; Timothy. 2010. Environmental Reporting Practices of the Largest U.S. Companies, Management Accounting Quarterly 12(1): 13-19.

Čiegis, R.; Tamošiūnas, T.; Ramanauskienė, J.; Navickas, K. 2010. Evaluation of sustainable development of industrial zones Šiauliai University. 343 p.

Dornfeld, D. A.; Jawahir, I. S.; Clarens, A. F.; Altman, K. 2013. Environmental leadership: from compliance to competitive advantage, Academy of Management Executive 8 (2): 7-20.

Durdevic, T.; Searcy, C.; Karapetrovic, S. 2013. The role of ISO 14001 in sustainable enterprise excellence, in The 5th European Conference on Intellectual Capital ECIC 2013, 11–12 April 2013, Bilbao, Spain, 2: 99–10.

European Commission. 2014. Environment Sustainable Development. Available from the Internet: <http://ec.europa.eu/environment/eussd/>

Farooque, O. A.; Ahulu, H. 2015. Environmental Reporting in the UK, Australia and South African Multinational Companies, The Journal of

Developing Areas. Special Issue on Sydney Conference Held in April 2015  
49(6): 103-118.

Genc, K. Y. 2013. Natural environment as a strategic issue for firms: theoretical perspectives, *Procedia - Social and Behavioral Sciences* 99: 143–153.

<http://www.sciencedirect.com/science/article/pii/S1877042813039256>.

Global Compact Network. 2015. Available from the Internet:<https://www.unglobalcompact.org/what-is-gc/participants>

Hart, S. L. 1995. A Natural-Resource-Based View of the Firm. *Academy of Management Review* 20(4): 986-1014.

Kinderytė, L. 2013. Model of the system for enterprise sustainability assessment: Doctoral dissertation. Kaunas University of Technology, Kaunas.

Kriščiūnas, K.; Staniškis, J. K.; Tričys V. 2007. Scientific activities: Modern Trends. Šiauliai university. p. 431.

Kshatri, N.; Chouksey, A. 2014. Environmental impact Assessment (EIA) study of exploratory oil well: A critical review, *International journal of pharmacy and life sciences* 5(12): 4045-4048.

Linke, B.; Dornfeld, D. A.; Yu-Chu, H. 2011. Establishing Greener Products and Manufacturing Processes. *International Symposium on Green Manufacturing and Application ISGMA*, (1): 1-7.<http://escholarship.org/uc/item/2m08j6qn>.

Nallusamy, S.; Dinagaraj, G. B.; Balakannan, K. 2015. Sustainable Green lean manufacturing practices in small scale industries, *International Journal of Applied Engineering Research* 10(62): 143-146.[http://www.academia.edu/15843435/SUSTAINABLE\\_GREEN\\_LEAN\\_MANUFACTURING\\_PRACTICES](http://www.academia.edu/15843435/SUSTAINABLE_GREEN_LEAN_MANUFACTURING_PRACTICES)

Navickas, K.; Venslauskas, K. 2012. Biomass Life cycle assessment. A.Stulginskis University. Kaunas, p. 82.

Oželiene, D.; Drejeris, R. 2015. Analysis of Methodological Potential for Evaluation of Corporate Sustainable Development, *Business in XXI Century* 7(2): 189-198.

Paul, I. D.; Bholeb, G. P.; Chaudharic, J. R. 2014. A review on Green Manufacturing: It's important, Methodology and its Application, *Procedia Materials Science* 6:1644-1649. [http://ac.els-cdn.com/S2211812814005148/1-s2.0-S2211812814005148-main.pdf?\\_tid=aaaf7d96-eea7-11e4-8ae8-00000aacb362&acdnat=1429896837\\_b4de14b620134fb710fe6b9516bb61cf](http://ac.els-cdn.com/S2211812814005148/1-s2.0-S2211812814005148-main.pdf?_tid=aaaf7d96-eea7-11e4-8ae8-00000aacb362&acdnat=1429896837_b4de14b620134fb710fe6b9516bb61cf)

Petrovic, N.; Slovic, D.; Cirovic, M. 2012. Environmental Performance Indicators as Guidelines Towards Sustainability, *Management Journal for Theory and Practice* 64: 5-15.

Ruževičius, J. 2011. Methodology Aspects of Ecological Footprint assessment, Economic changes in the value of assets and trends and management measures, *Research Paper*: 124-135.

Rudzkiene, V.; Burinskiene, M. 2007. Assessment of transformation processes in the complex socio-economic system of transition period, *Intellectual Economics* 1: 74-81. <https://www.mruni.eu/upload/iblock/4c1/Vitalija%20RUDZKIENE,%20Marija%20BURINSKIENE.pdf>

Seetharaman, A, Ismail, M.; Saravan, A. S. 2010. Environmental accounting as a tool for environmental management system, *Journal of Applied Sciences and Environmental Management* (11) 2: 137-145.

Silcher, S.; Seeberg, B.; Zahn, E.; Mitschang, B. 2013. A Holistic Management Model for Manufacturing Companies and Related IT Support. *Procedia CIRP* 7: 175 – 180. <http://www.sciencedirect.com/science/article/pii/S2212827113002370>.

Staniūnas, M. 2013. Ecological assessment in Urban Comprehensive plans: Doctoral dissertation. Vilniaus Gediminas Technical University. Vilnius: Technika.

Šimanskienė, L.; Paužolienė, J. 2012. Sustainable Development in Organizations using Standards, *Tiltai* 1: 45–56.

A Stronger Growth of European Industry" COM. 2014. The opinion of the Department of Social Affairs of European Economic and Social Committee on the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Available from Internet: [www.lpk.lt/sites/default/files/eesc-2014-00746-00-00-ac-tra-lt\\_0.doc](http://www.lpk.lt/sites/default/files/eesc-2014-00746-00-00-ac-tra-lt_0.doc)

Xiaolin, Z.; Yongmei, G. 2014. The study of Japanese corporate environmental management behavior based on product life cycle perspective, *Journal of Chemical and Pharmaceutical Research* 6(5): 1601-1604. online [www.jocpr.com](http://www.jocpr.com).

Ulhoi, J.P., Madsen, H. New patents in corporate sustainable development?. 2013. *Social and Behavioral Sciences* 46-56. [www.sciencedirect.com](http://www.sciencedirect.com).

Zdanyte, K.; Neverauskas, B. 2014. Ensuring of Sustainable Development For Contemporary Organizations Development, *Economics and Management* 19(1): 120-128.