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Eco-innovations in the development of companies

Ekoinnowacje w rozwoju przedsiębiorstw

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Summary

Contemporary development conditions force companies to undertake activities in the scope of environmental protection, that should be convergent with the basic economic goals of the conducted business activities. Among numerous possible solutions eco-innovations deserve special attention as their implementation not only conditions the company's growth, but also brings measurable benefits both to the company itself and to the environment and society with which the company creates an inseparable and coherent whole.

Streszczenie

Współczesne uwarunkowania rozwojowe wymuszają na przedsiębiorstwach podejmowanie działań w zakresie ochrony środowiska, które powinny być zbieżne z podstawowymi celami ekonomicznymi prowadzonej działalności gospodarczej. Spośród wielu możliwych rozwiązań na szczególną uwagę zasługują ekoinnowacje, których implementacja nie tylko warunkuje rozwój przedsiębiorstwa, ale przynosi mu również wymierne korzyści, podobnie jak środowisku naturalnemu i społeczeństwu, z którymi współtworzy nierozdzielalną i koherentną całość.

Słowa kluczowe: ekoinnowacje, ochrona środowiska, rozwój przedsiębiorstwa

Keywords: eco-innovations, environmental protection, development of the company

Introduction

The advancing degradation of the environment leads to a situation, in which ecological aspects determine the processes occurring in the global economy to a continuously growing extent, and in consequence, they really strongly influence the functioning of contemporary companies. Simultaneously the current approach to organisation management is changing due to the fact, that the present growth of companies is conditioned not only by the realisation of economic goals, but also of the social and ecological ones, and additionally the latter are being popularised by proper state policy. This is visible in the example of the changing paradigm of traditional economy to ecological economy, which faced with the exhaustion of natural resources is oriented on environmental protection, as the environment constitutes the foundation for development of every economy (Woźniak, Trinks and Bącal, 2004, pp. 682-687). In consequence of these changes companies need to search for solutions involving care for the

environment and pay close attention to the ecological safety of their production processes and products while simultaneously respecting the demands of economic effectiveness.

A specific manifestation of both efficient and effective proecological activities is constituted by eco-innovations as their implementation considerably influences, among others, the image of the company and of the products it offers, which means that eco-innovations more and more frequently become an important element of development strategies (Eryigit and Özcüre, 2015, p. 1216). In case of eco-innovations another important factor is the ever stronger ecological trend and the popularisation of new concepts of conducting business activities based mainly on sustainable growth or ecological responsibility of business. In consequence, the objective of the hereby article has become to define the essence of eco-innovations and of the role they play in the development of contemporary companies in correlation to guaranteeing safety to the environment, the protection of which is becoming one of the prime global challenges particularly in the economic dimension.

Specification of the notion and types of eco-innovations in companies

The issue of eco-innovations or as they are called alternatively ecological innovations started spreading in the 1990s with the increase of awareness of threats related to pollution and also with the rise of importance of innovativeness and innovations in the process of improving competitiveness and economic growth (Szpor and Śniegocki, 2012, p. 3). It was at that time, that the clear process of innovation evolution towards solutions of purely ecological nature began. However, this does not mean, that earlier these issues had not been dealt with, on the contrary research into pollution or environmental innovations had been performed, but the approach had been rather extreme due to the fact that economic aspects had not been taken into consideration (Kesidou and Demirel, 2012, pp. 862-863.).

In current economic situation eco-innovations may be classified as the derivative of innovation activities, which are and shall be undertaken by companies overwhelmingly with becoming environmentally friendly in mind, which additionally enables them to create the image of an ecological business, constituting an efficient element of competitive advantage. The first definition of eco-innovation presented in literature was formulated by C. Fussler and P. James (2002, pp. 303 – 305), who described eco-innovation as creation of new products, services or processes which provide the consumer and all the other business entities with

measurable benefits while simultaneously reducing the destructive influence of business onto the environment. In the area of foreign literature many authors dealing with the issue of ecoinnovations should be enumerated apart from Fussler and James and they include K. Rennings, T. Zwick, M. Carley, P. Spapens, M. Charter, T. Clark and M. M. Andersen. At the same time we should pay attention to the variety of definitions of eco-innovation, which pictures certain freedom of interpretation in relation to this phenomenon and cover also other benefits in the context of environmental protection. This fact can be further confirmed by interchangeable use of the notions of eco-innovations, ecological innovations or sustainable environmental innovations in foreign literature, and these notions according to numerous experts frequently possess ambiguous meaning thus resulting in certain cognitive dissonance which, unfortunately, can be also observed in case of national literature on the subject.

Within Polish literature the spectrum of definitions of eco-innovations is far less diverse, which stems from the fact, that issues of environmental protection are relatively “young” in Poland and the process of gaining appropriate importance was initiated following the political transformation and accession of Poland to the European Union, where the social awareness and care for the environment is considerably larger. The examples of Polish authors defining the notion of eco-innovation in Polish literature are among others: B. Ziółkowski, A. Leszczyńska and J. Łunarski, and the most extensive definition of eco-innovation was presented by J. Przychodzień (2015, p. 47).

The list of selected definitions of eco-innovations, which can be found in English and Polish literature has been presented in Table 1.

While defining eco-innovation numerous authors frequently refer to the known notion of eco-innovation emphasising strongly, that in this case environmental protection and ecological benefits for all beneficiaries of such innovations and not necessarily for the companies implementing the said innovation constitute the most important aspect. And although there exists no single, unified definition of eco-innovation and in spite of the existence of numerous synonyms of this notion, this diversified descriptions do not alter the essence of the notion of eco-innovation, which relies in the realisation of economic activities of innovative nature and in particular the implementation of innovations, that do not exercise negative influence onto the environment while simultaneously respecting the rules of environmental protection.

Table 1. Selected definitions of ecoinnovations from English and Polish literature

AUTHOR	DEFINITION OF ECO-INNOVATION
C. Fussler, P. James	Eco-innovation means the development of new products, processes or services providing appropriate value to both customers and companies with simultaneous considerable reduction of negative influence onto the environment.
K. Rennings, T. Zwick	Environmental innovations are such innovations which include new or modified products, processes, techniques or systems aiming at the reduction of negative influence onto the environment (constituting a basic element of sustainable growth).
M. M. Andersen	Eco-innovation is the type of innovation which exercises positive influence onto the environment possessing the ability of attracting proecologically minded investors into the market and whose implementation may generate "green" profits.
M. Carley, P. Spapens	Eco-innovation is a deliberate course of action constituting a manifestation of entrepreneurship yet accounting for ecological issues when developing certain products and processes connected with their lifecycle, additionally leading to the increase of quality of the product or service.
European Commission – two definitions	Eco-innovation is the production, assimilation or exploitation of a product, process, service or new management method which throughout the whole period of its existence reduces the risk of generating pollution or of other negative effects of improper exploitation of natural resources /according to MEI Project (<i>Sixth Programme of the European Community</i>)/ Eco-innovation constitutes a combination of two key objectives which condition simultaneous improvement of the economic situation and the ecological situation allowing for the obtaining of benefits by both the company and the environment /according to ECODRIVE Project (<i>Sixth Programme of the European Community</i>)/
OECD	Eco-innovation is such innovation, which can be distinguished among others by the fact, that: It leads to the reduction of negative influence onto the environment regardless whether this is an intended or unintended effect, Its scope may extend beyond the conventional organisational boundaries of the entity implementing the said innovation and cover wider social structure thus initiating changes in the existing social and cultural norms and institutional structures.
B. Ziólkowski	Eco-innovation defines a specific type of innovation created to protect the environment and identified with the so called green innovations, environmental technologies or green technologies.
J. Łunarski	Eco-innovation is such type of innovation which either directly or indirectly contributes to the reduction of environmental burdens.
A. Leszczyńska	Eco-innovation in the wider sense is identified with sustainable innovations while in the narrower sense it denotes materials, processes and practices the implementation of which results in the reduction of use of hazardous materials, energy or water in business activity or if the said implementation contributes to the more effective exploitation of natural resources.
J. Przychodzeń	Eco-innovation constitutes a particular type of innovation including new technologies, products and services, management, supplying, distribution and promotion, which generate profit and increase competitiveness while simultaneously taking into consideration the sozo-economic balance (that is the economic balance extended by the environmental and social aspects), where the beneficiaries of implementation of the eco-innovations are companies, general public and the environment.

Source: own materials based upon the literature on the subject (Fussler i James, 2002, s. 303-305; Andersen; 2008, s. 5; Carley i Spapens, 2000, s. 157; Rennings, 2000, s. 322; OECD, 2009; ECODRIVE, 2008, s. 4; MEI, 2008; Ziółkowski, 2006, s. 555; Łunarski, 2010, s. 77; Leszczyńska, 2011, s. 35; Przychodzeń, 2015, s. 47)

At this point the possibility of interpretation diversity when identifying eco-innovations is worth mentioning, as has been done by e.g. P. Ekins, who hints at the differences in the effects obtained thanks to the undertaking of eco-innovative activities. At the same time the same author stresses the fact, that the core of the problem is not in different nomenclature, but rather in the economic aspect of implementing eco-innovation constituting the main objective of such implementation by businesses (2010, p. 269-271). In consequence of such approach, the assumption that eco-innovations should bring both economic and environmental benefits was accepted and if they shall result solely in positive influence onto the environment, then they should be classified as innovations deprived of economic effects, which in the world literature are generally identified as environmental innovations.

The introduction of the economic criterion leads to the differentiation of two groups of eco-innovations, which in the simplified formula can be labelled “modern” and “traditional” and this seems particularly justifiable in the light of changing paradigms of management and growth of contemporary companies. The first group of innovations is created by ecological innovations, which simultaneously provide economic and ecological benefits thus constituting the subject of further discussion in the hereby article, whereas the other group includes environmental innovations concentrating strictly on benefits for the environment.

Apart from the classification mentioned above, also other classifications of eco-innovations deserve our attention, as they largely constitute derivatives of the numerous divisions characteristic for typical innovations. From the point of view of companies and economy the most important division seems to be the one following the OECD typology, which defines three basic type criteria, namely; the subject criterion (distinguishing the product, process, organisation and marketing eco-innovations), the criterion of implementation mechanism (dividing eco-innovations into the modifying, improving and redesigning products, services or the production process and into those searching for new solutions) and the criterion of influence of implementation onto the environment (distinguishing eco-innovation of micro, mezzo and macro scale) (2009, pp. 41-46). For instance, according to A. Leszczyńska one of the most important types of eco-innovations are process eco-innovations due to the fact, that production processes generate the biggest ecological problems and constitute the source of

serious pollution. The above mentioned eco-innovations are also described as environmental technologies and, depending on the effect of their implementation, they are divided into integrated and additive (or of the end of the pipe) innovations. The integrated technologies are characterised as new, modified processes, technologies, systems or products which facilitate the avoidance or considerable reduction of pollution. They usually require substantial investment, but in long term perspective they become profitable generating a visible reduction of costs for example in the form of reduction of energy expenditure (Rio Gonzalez, 2009). Additive technologies also known as technologies of the final production state, on the other hand, are considered in the category of activities limited to recycling or reclamation (Leszczyńska, 2011, pp. 36-37). Thus in the current stage of economic growth integrated technologies are definitely more desirable, as their implementation eliminates the negative influence of technological processes onto the already seriously degraded environment thus leading to preventive rather than corrective activities, which only limit the negative effects of their application.

Nowadays, the scope of application of eco-innovations is really wide, as they may be implemented in all possible areas of our lives and in case of companies they may refer to areas, such as for instance: alternative types of energy, more efficient exploitation of natural resources, energy saving, liquidation of damages in environment, transport, recycling, development and production of new products, processes, creation of new business models, alternative application of the already existing products and materials, environmentally friendly agriculture or construction business or finally eco-tourism (Sarkar, 2012, pp. 8-9). Simultaneously the treatment of environmental issues as equally important as business aspects characteristic for eco-innovations results in the fact, that their absorption may bring a series of measurable, although sometimes long-awaited, benefits both for the companies that implement them and for the environment (Leszczyńska, 2011, p. 44). In case of companies the basic benefit shall naturally be financial issues connected with the reduction of costs of production, logistics or the lack of environmental fees and also with the increase of market share resulting from the creation of the image of environmentally friendly company.

Eco-innovative conditions for company development

In the era of continuously changing economic conditions maintaining status quo is practically impossible, hence the fundamental objective of activities initiated by contemporary companies is the continuous pursuit of measurable market success. The current reality faces companies

with ever growing demands but it also creates new areas of activity thanks to which the companies obtain the opportunity to develop and grow. Nevertheless, conducting business activities is becoming an ever growing problem for those managing companies particularly in terms of shaping and creating the surrounding reality. In such complex, changeable and frequently unfavourable conditions of the surroundings development and growth of companies require from the managers to be constantly focused on the issues of shaping the conditions and mechanisms of the said growth (Pierścionek, 2003, p. 11).

In the classic approach the development of an entity may be treated as the transition from a micro company – one operating in the local market – to huge corporation – operating in the global scale; or alternatively to an entity with extensive and complex structure. When discussing company's development, it is also recommended to refer to the various variants of company's growth theory, which focus on the objectives of the organisation and their relation to the assumed development and growth strategy and also on defining of the basic factors and development limits of a company (rejecting the assumption of the maximisation of profit in the category of the only objective) (Pierścionek, 2003, p. 28). Additionally, company growth models are also described which might be: innovative in their character (entrepreneurial, distinguishing) – based upon the innovation or quality, or restructuring – based upon the reduction costs or imitative – reduced to simultaneous reduction of costs and implementation of incremental or imitative innovations on the grounds of time advantage (Chodyński, 2007, p. 18).

Generally, development of companies guarantees their survival in the contemporary, highly competitive market and the fullest measurement of the said growth in the economic approach is maximising of profit or increase of value for the shareholders or possibly providing value for the remaining stakeholders. In the qualitative approach the company's development is perceived as a complex and long lasting process leading both to the modification of its elements and to the level of the company, which is most frequently expressed by the changes in the company's mode of operation, the increase of its effectiveness or alterations in its structure (Szczepaniak, 2007, p. 573). Thus, in its essence it leads to substantial transformations and changes in the company's structure. This outlook falls within the concept of J. Schumpeter, who describes the so called creative destruction relying in the continuous destruction of old structures in order to create new, far more effective companies, which by replacing the old ones create opportunities for development for both for individual businesses and for the economy as a whole. The heart of this phenomenon is an entrepreneurial idea which combines the stage of occurrence of a new idea in the process of creative thinking with the stage of successful

implementation of the said idea (Bruce and Birchall, 2009, p. 5). Company's development may also be analysed through the prism of adjustment of selected areas of the company's operations to the evolving surroundings and then it relies in the implementation of specific innovations, e.g. the process, product, organisation or marketing ones) (Strużycki, 2011, p. 111).

The economic practice show, that a company may develop in many various ways, but it is most favourable, if this process is based on the already possessed company's resources, the motivation and skills of its employees and if it relies in the implementation of any type of innovations. The resources possessed and obtained by the company are particularly important, as their skilful exploitation provides the possibility to create and introduce innovations onto the market (Zastempowski, 2010, p. 157). We need to remember that innovations constitute the main propelling force for the majority of changes occurring in our surrounding thus considerably increasing the chances of survival of an entity in the highly competitive global market. At the same time, contemporary companies more and more frequently perceive innovations as a passport to the world of development and progress treating them as a strategic tool of organisations, which allows them to build and extend their capabilities and to generate beneficial changes for them. (Kamińska, 2014, p. 85).

In consequence, in the era of permanent change the development of companies should be stimulated by activities of innovative character, as innovations provide the best guarantee of achieving the said growth, which has been proven, among others, by the experience of highly developed countries (Wysocki, 2015, p. 93). As observed by M.E. Porter, innovations are one of the few factors guaranteeing obtaining permanent competitive advantage and the economies whose businesses implement innovations develop much faster than the other ones (Porter, 1990, p. 63). Thus growth and development become a process inseparably connected with the implementation of all types of innovations, which decide on the success of the said process yet always on condition of making rational business decisions. This is supported by currently appearing problems connected with the degradation of the environment and also considerable reduction of existing natural resources. These factors lead to a situation in which environmental protection aspects are becoming – for companies' management – a natural area of search and exploitation of appearing development opportunities as well as of conditions favourable for the creation of eco-innovative ideas subsequently applied in practice, which results from, among others, the growing social requirements and state policies or international institutions in the scope of environmental protection.

When conducting the analysis of the influence of eco-innovations onto the company's development it is important to analyse this process taking into consideration the so called

organisation lifecycle defined within the classic theory of company's development, as in case of the said lifecycle each of its four stages shall create different conditions for the implementation of innovative ecological solutions and shall be characterised by different economic rules. Moreover, it is worth remembering that the company's development depends not only on its financial capability but in the case of ecoinnovations it may entail the exploitation of proecological approach to the performance of business activity and adjusting to the environmental expectations of customers. The company shall then develop as the result of realisation of ecological objectives and indirectly also social objectives, which is manifested, among others, in the sustainable development concept (Diaz-Garcia, González-Moreno i Sáez-Martinez, 2015, p. 7).

An extremely important issue in the context of implementation of eco-innovation, perceived as the determinant of long-term development of the company oriented on profit and growth of value, is the inclusion of the realisation of this process in the formalised strategy which accounts for additional proecological objectives among the main strategic goals. Contemporary organisations willing to face the development requirements definitely need to possess development strategy and to shape it in such manner, as to include possibly large number of non-economic objectives and above all those connected with environmental protection, which alongside the technological progress and flow of time shall gain in importance. Such approach forces companies to introduce substantial changes in the manner of defining and realisation of their business goals, which should correspond to social expectations or the economic policy of the state in the scope of environmental protection and stimulate eco-innovative activities within the frames of the prepared development strategies. A company's general strategy is after all strongly connected with its development (Pierścioneck, 1996, p. 13). The change of paradigm of the performance of business activity seems irrevocable due to the fact, that eco-innovations themselves in the feasibly possible way guarantee the realisation of economic, social and ecological goals. Consequently, the process and product eco-innovations need to be classified as the most desirable types, as their implementation over a long period should produce the greatest benefits both for the company and for the environment. Naturally, one needs to remember, that these benefits shall be correlated to the conducted business activity, hence the largest eco-innovative effects should be expected in case of the greatest polluters, in majority of cases in relation to heavy industry, power plants, mining, production and transport companies as well as agriculture. For instance according to the Main Statistic Office (GUS) in 2014 the greatest percentage of water consumption for the needs of national economy and citizens was observed in industry (approx. 75% of total water consumption), while the main

sources of waste were mining and excavation industry (approx. 53% of total generated waste), industrial processing (22%) and production and delivery of electricity (17%) (2015, pp. 32-41).

Conclusion

Alongside development of civilisation and evolving paradigms of conducting business activities companies are forced to simultaneous realisation of economic, social and ecological objectives. Especially, the issues of ecology and environmental protection are gaining importance, as they are becoming one of the pillars of development of the contemporary world. What is more, if we take into consideration the permanent instability of the surroundings which imposes fast pace of introduction of changes which additionally prove necessary for the continuation of the process of company's growth, the need to search for solutions of innovative nature becomes clearly visible. Especially the ability to use arising opportunities and of quick adaptation to new conditions of functioning have become key factors with special attention paid to any activities, which enable the implementation of ecological solutions, prevent degradation of natural resources and additionally gain approval of the customers, and in wider perspective of the general public.

In the described situation eco-innovations seem to be the best solution for companies aspiring to meet the requirements of the contemporary world as they follow in the footsteps of standard innovations and begin to be more and more frequently considered as sine qua non condition of maintaining and strengthening of the company's competitive position. Their importance is growing continuously not only because of the ever growing concern for the environment, but also because business entities themselves perceive eco-innovations as an opportunity for gaining competitive advantage and obtaining perspectives for long-term development (Carillo-Hermosilla, Rio Gonzalez i Könnölä, 2010, p. 1075). Moreover, appropriate and well thought-through implementation of eco-innovations, in spite of the fact that in the initial stage it is truly costly, in the final balance generates benefits both for the environment e.g. in the form of reduction or total elimination of pollution and for the company implementing such innovation, for instance in the form of reduction of production costs, greater effectiveness of the production process or visible image effects.

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