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## IMPLEMENTATION OF ECO-INNOVATION IN ENTERPRISES

**Abstract:** Implementing eco-innovation in the face of critical environmental degradation has become a necessity. It is necessary to create procedures that companies could apply when they implementing green initiatives. This article presents a proposal for an eco-innovation implementation procedure that highlights the importance of the planning stage. The scheme was developed on the basis of a critical review of the literature and conclusions of the research that was carried out as part of the doctoral dissertation ‘Environmental management in SME enterprises of the śląskie voivodship’.

**Key words:** ecoinnovation, green innovations, implementation of innovation

J E L:

### INTRODUCTION

In times of a rapidly changing climate, it is difficult to ignore the environmental impact of human activities. Nowadays, the effects of anthropogenic pressure threaten not only the environment itself but also people. Extreme weather phenomena such as heat waves, floods, droughts or forest fires are both a direct threat to human life and health, as well as a cause of millions of losses in economies. In some cases, due to the creation of shortages in supplies of water and food, they can even lead to civil conflicts [Hsiang, Keng, Cane, 2011, pp. 438–441].

Due to the above, the importance of implementing actions and shaping attitudes that limit or eliminate this impact is more and more often emphasized. It is necessary to integrate political, economic and social activities what will guarantee the opportunity to meet the essential needs of individual communities

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or citizens of contemporary, as well as of future generations (sustainable development of economies) and significantly reduce human interference in the environment [Mazur-Wierzbicka, 2005, p. 34; Liczmańska-Kopcewicz, et. al., 2019]. In order to accomplish this purpose it is necessary to increase the level of ecological awareness and change behaviour and attitudes for more environmental friendly. It should be emphasized that these activities must have holistic character and be carried out according to the bottom-up approach, beginning with changes to more pro-environmental behaviours of individuals and business entities to systemic changes in society as a whole [Kucęba 2019 pp. 256-257].

For this process to be effective in the economic sector, it is crucial to convince entrepreneurs that pro-environmental innovations – eco-innovations are beneficial- i.e. as a way to achieve competitive advantage and as a factor that may be the key to the organization’s success. It is also necessary to indicate how such innovations should be implemented.

## ENVIRONMENTAL AWARENESS VERSUS ENVIRONMENTAL ATTITUDES OF ENTREPRENEURS

The concept of eco-innovation was introduced to the literature over 20 years ago by C. Fussler and P. James [Fussler, James, 1996], who defining it as new product and process that provide added value to business and clients, simultaneously reducing the environmental impact. At present, innovations of this type are differently named and defined in literature [Schiederig, Tietze, Herstatt 2011; Dahan, Yusof 2016] however an environmental benefit which results from them is always emphasized. It may include increasing the efficiency of using resources, preventing or minimizing negative impact on the environment, but also shaping new pro-environmental social attitudes.

Regardless of the scope of ecoinnovation, its implementation depends on the level of ecological awareness of entrepreneurs.

Gliński, Poskrobko and Mirowski [Gliński, 1996, pp. 133-145; Poskrobko, Poskrobko 2012, pp. 28-32; Mirowski, 1999, pp. 9-15] pointed that the increase in ecological awareness is associated with the perception of environmental threats and their impact on human needs. Such observations evoke the desire to search for information, increase knowledge associated with environmental protection and overall better perception of environmental problems.

Achieving higher levels of environmental awareness results in the transition from passive to ecologically active attitudes.

In organizations with a passive attitude (also called reactive), environmental issues are not among the priorities, environmental initiatives are rare and rely almost entirely on compliance with legal obligations imposed by national or local regulations. The active type (proactive) are companies, in which

environmentally-friendly activities are often and their scope goes beyond the legal obligation. Such activities may be technological and non-technological. Second one includes: creating departments responsible for environmental initiatives, entering environmental goals in the organization's policy, participation in ecological competitions, obtaining environmental certificates and awards [Nath., Ramanathan 2016, pp. 427–437; Henriques, Sadorsky 1999, pp. 89–99; Hunt, Auster, 1990, pp. 7–18].

Poskrobko and Poskrobko [Poskrobko, Poskrobko 2012, p.32] distinguish 6 levels of ecological awareness:

- level I – ability to identify symptoms of environmental degradation
  - level II – ability to notice the effects of environmental degradation
  - level III – appreciating the value of a non-degraded environment
  - level IV – widespread interest in environmental protection issues (not only local but also global)
  - level V – reacting to the emergence of pro-ecological social pressure
  - level VI – acceptance to take pro-environmental behaviour forms
- Kucęba [Kucęba R. 2019, p.260] indicates two more:
- level VII – ability to introduce systemic pro-environmental changes, in three primary areas: product manufacturing, production technology and management
  - level VIII – ability to completely eliminate threats that create the risk of disturbing the ecosystem's compounds.

Furthermore, Kucęba stresses that currently enterprises do not reach levels above level V (most of the organizations surveyed by him did not even reach level IV).

Studies usually indicate several stages of the evolution of an organization, which are directly related to the increase in ecological awareness. For example, Gajdzik and Wyciślik [Gajdzik, Wyciślik, 2010, pp. 81-82] talk about an increase in the organization's environmental commitment from passive stage (meeting only legal requirements), through defensive (gradual withdrawal of products that do not meet ecological standards, partial resignation from outdated technologies, pro-ecological modification of production processes); innovative (implementing new cleaner technologies, producing ecologically safe products, recycling waste) to ecologically offensive (clean production, eco products, pro-ecological management style, pro-ecological marketing, ecological culture of the organization).

Zhang, [Zhang, 2014, pp. 15-16] identifies the following types of organization behaviour related to the transition from passive to active:

- 'Pre-compliance' – the company perceives environmental issues only as a barrier, which does not give the possibility of obtaining any benefits for the company, what is the reason why it maintains current practices without taking into account environmental legislation.

- ‘Compliance’- the company considers all green investments as an unnecessary cost. However, it respects the laws and regulations relating to the environment protection, in order to avoid penalties.
- ‘Beyond compliance’- environmental innovations are considered new technical standards that should be implemented in the enterprise. The company recognizes the opportunity to reduce the costs through higher resource efficiencies and waste controlling. But, environmental still issues are separated from core business development.
- ‘Sustainability’- environmental issues are part of the company’s vision and business strategies. Moreover, organization does not expect an immediate refund costs of pro-ecological initiatives, because it assumes that they will bring results in the long run.
- ‘Purpose and passion’ - environmental issues come first in the organization’s activities. It is not dedicated to business. Rather, it is a proposal for a non-profit organization for ‘helping to save the world’.

## BENEFITS AND BARRIERS FOR THE IMPLEMENTATION OF ECO-INNOVATION

As already mentioned in the introduction, the necessity to implement eco-innovations remains beyond discussion. The increase in the number of such initiatives seems to be particularly significant in smaller organizations, as small and medium enterprises, which constitute the backbone of most economies [Wielgórka 2018, pp. 51-65].

Meanwhile, as it was stated after conducting own research<sup>1</sup> and literature review, entrepreneurs encounter many barriers during the process of implementation eco-innovation. The most frequently mentioned obstacle to the implementation of green initiatives is the lack of funds. It is indicated as the main reason for limiting such activity in all analyzed sources – both official European Commission reports [Directorate-General for Communication, 2015; 2018] as well as the works of various authors [for example: Bartoszczuk, 2015, pp. 125-136; Szpor, Śmiegocki, 2012; Wielgórka, 2018, pp. 51-65; Kucęba, Jędrzejczyk,

<sup>1</sup> The research was carried out as part of the PhD thesis entitled: ‘Environmental management in SME enterprises of the śląskie voivodship’ at the Faculty of Management Częstochowa University of Technology. 2729 enterprises were invited to the survey, 100 of whom were participants in the ‘Zanim udusi nas SMOG, project, the remaining 2629 enterprises were organizations that received funding for the implementation of innovations from EU funds in 2007-2013. The research material was collected using two methods: CAWI (Computer Assisted Web Interview) and PAPI (Paper & Pen Personal Interview). The research was carried out in 2017 and 2018. 117 companies responded to the invitation (4% of invited companies). The respondents were the owners and managers. Finally, 100 questionnaires were qualified for the statistical analysis. The remaining 17 were rejected due to incomplete data. Research results and conclusions are included in the doctoral dissertation ‘Environmental management in SME enterprises of the śląskie voivodship’.

2015, pp. 23-30]. The high costs may result from the purchase of new technologies, R&D processes, employment of new people, downtime of production, financial instruments (interest on loans) etc.

Other factors that inhibit the implementation of eco-innovation include: long payback period, complicated procedures for obtaining subsidies/loans, complicated administrative and legal procedures, no demand for eco-products/services among contractors, lack of knowledge about new technologies, lack of knowledge about financing options, views of decision makers, lack of qualified staff or no possibility to invest in rented property [Rossi, German, Zamagni A. 2016, pp. 361-373; Koszarek-Cyra 2016, pp. 189-200; Directorate-General for Communication, 2015; 2018; Zastempowski et. al., 2018].

In the opinion of the author of this article, a significant obstacle to the implementation of eco-innovation is also the lack of recognition of the benefits of such activities. It results from a simplified profit/loss analysis. This analysis bases only on the financial account of costs incurred and direct profits - from the sale of products or saving of raw materials.

Entrepreneurs often do not include indirect profits such as:

- improving the company's image / the company's attractiveness on the market, which increases the value of the organization,
  - acquiring new customers and competitive advantage - thanks to better-quality products and new technologies
  - gaining „environmentally” sensitive customers,
- And on a wider scale:
- increasing national security/stability market - competition for limited resources can lead to conflicts
  - environmental benefits - reducing waste and pollution.

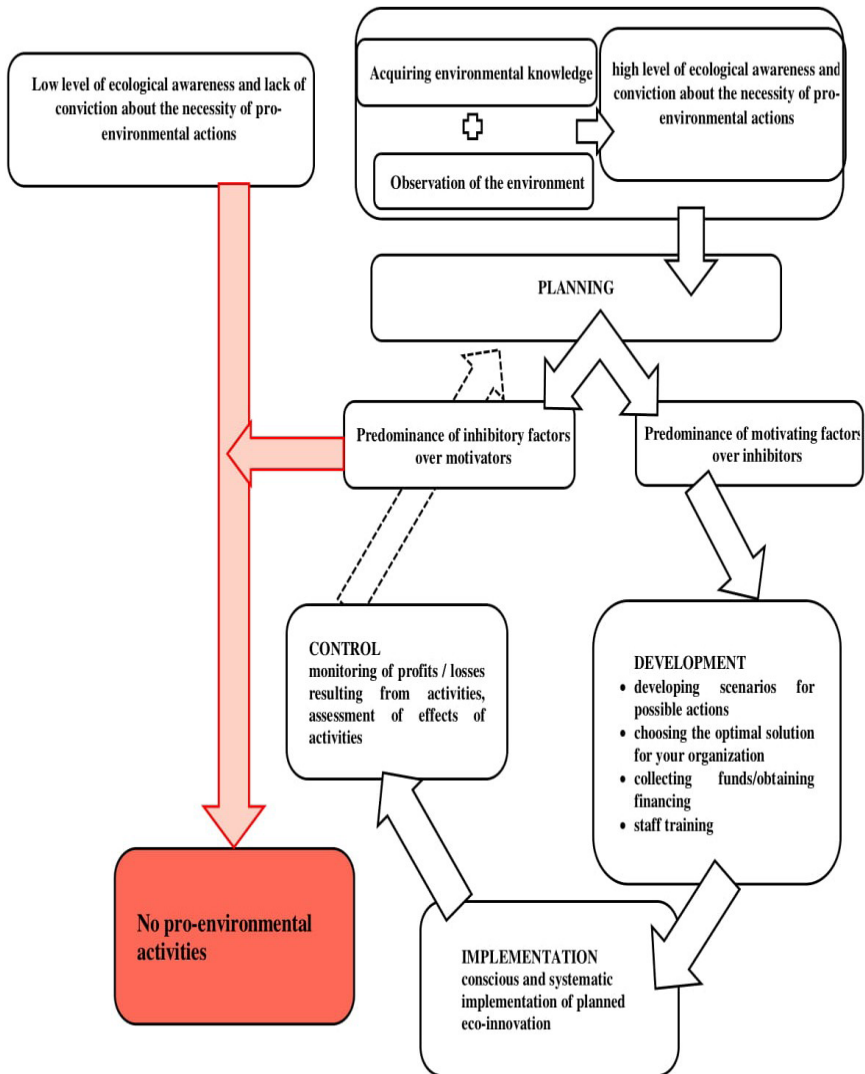
These benefits can be multiplied and barriers reduced by appropriate and diligent preparation of implementation of eco-innovation.

## IMPLEMENTATION OF ECO-INNOVATION IN ORGANIZATIONS

In the literature on the subject, often proposed model of the implementation of eco-innovation is based on the PDCA (Plan-Do-Check-Act) scheme [PN-EN-ISO-14001], which gives equal weight to all 4 stages. However, the conclusions drawn from the own research, incline the author to state that the planning stage is the most important in this process and determines the success of all others. The proposed implementation scheme reflects this view by emphasizing and detailing the planning stage as the one that determines the entire process. The eco-innovation implementation scheme is presented below. It was created during the doctoral dissertation 'Environmental management in SME enterprises of

the śląskie voivodship' (Fig. 1). For greater readability, the element concerning planning stage has been separated and presented in an additional drawing (Fig. 2). In the main diagram it has been simplified.

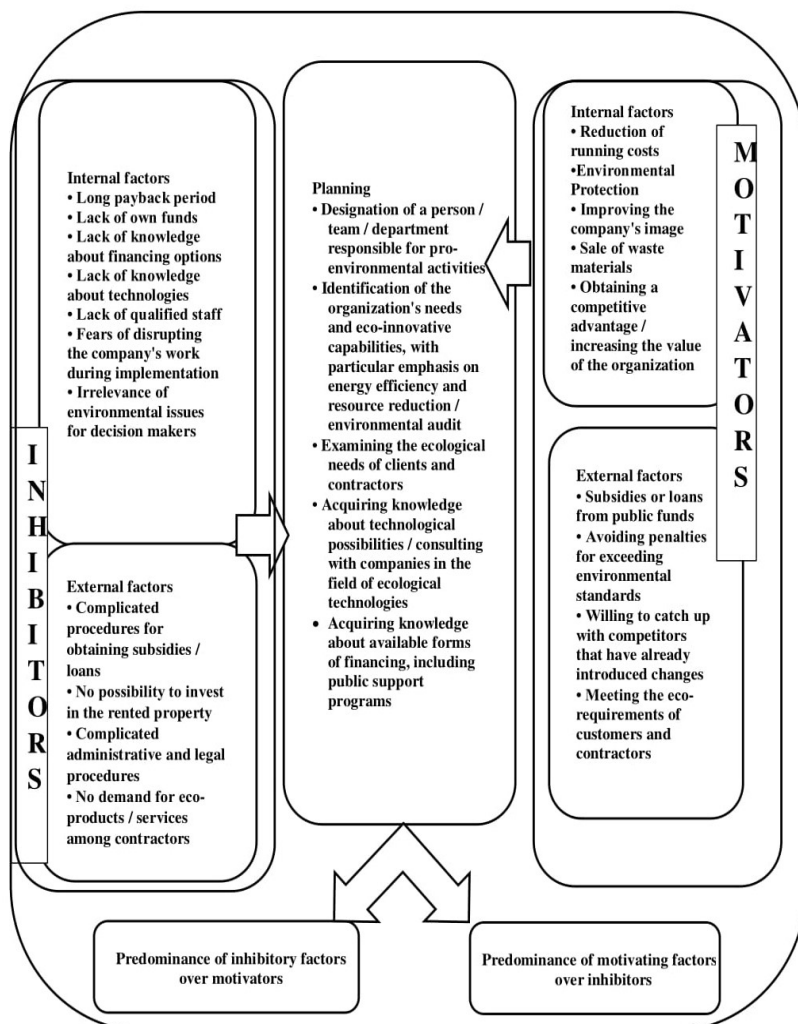
Fig.1. Diagram of the implementation of eco-innovation in the enterprise.



Source: own study based on the doctoral dissertation 'Environmental management in SME enterprises of the Silesian voivodship'

As mentioned above, the basis for pro-ecological activities is the increase in ecological awareness resulting from the observation of the environment and the acquisition of environmental knowledge by managers. After reaching the appropriate level of awareness, the organization can begin to plan activities (Fig. 2)

Fig.2. The planning stage of the eco-innovation implementation process



Source: own study based on the doctoral dissertation 'Environmental management in SME enterprises of the Silesian voivodship'

The first step is to designate the person or department in the company responsible for implementing eco-innovation. It will reduce “the blur” of responsibility and makes it easier to enforce tasks in later work. The next step is to examine the needs of the organization and the organization’s capabilities. One of the recommended ways is to conduct an environmental audit, that identifies in which areas of the company are deficits. It is also advised to analyse the opportunities and threats related to the requirements / needs of the surrounding, including the demand for eco-products among contractors and customers. At this stage, it is crucial to expand knowledge on the technical possibilities of implementing eco-innovative projects (e.g. new production technologies, the possibilities of installing renewable energy sources and devices limiting water and energy consumption). It is also necessary to conduct an in-depth research in the financing possibilities, including the conditions for obtaining subsidies from public funds and banking products available for the organization.

After carrying out the above activities, an analysis of the importance of all external and internal inhibitory and motivating factors of ecological activities should be carried out (Fig. 2). In a situation that inhibitory factors predominate motivating, it is advisable to postpone taking action until it changes.

In the case of a predominance of motivators, the organization can start the second stage, in which the most favourable scenario of conducting activities is selected, financial resources are collected and staff related to the implementation of eco-innovation at the operational level is trained.

The next step is the systematic implementation of planned eco-innovative activities.

The process ends with checking the results of the changes that have been made. This is also a very important stage, that is often overlooked or treated superficially by entrepreneurs. Systematic control of achieved results is the basis for planning further activities.

## CONCLUSIONS

Implementing eco-innovation in organizations in the face of critical environmental degradation has become a necessity. However, this process can be difficult, especially for smaller organizations. It is therefore important to emphasize the need for advanced preparatory activities, which should constitute the basis for further actions.

Correct selection of the most proper eco-innovation for a specific organization and its efficient implementation, not only will bring measurable benefits to the company but also becomes a motivating factor for future action.



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## IMPLEMENTACJA EKO-INNOWACJI W PRZEDSIĘBIORSTWACH

**Abstrakt:** Wdrażanie ekoinnowacji w organizacjach w obliczu krytycznej degradacji środowiska stało się koniecznością. Koniecznym jest opracowanie procedur postępowania, które firmy będą mogły zastosować przy wdrażaniu zielonych inicjatyw. W niniejszym artykule została zaprezentowana propozycja procedury wdrażania ekoinnowacji, która uwypukla ważność etapu planowania. Schemat został opracowany na podstawie krytycznego przeglądu literatury i wniosków z badań przeprowadzonych w ramach pracy doktorskiej „Zarządzanie środowiskowe w małych i średnich przedsiębiorstwach województwa śląskiego”.

**Słowa kluczowe:** ekoinnowacje, zielone innowacje, implementacja innowacji