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ECO-INNOVATIONS OF B2C COMPANIES IN POLAND: DIAGNOSIS OF AREAS, FORMS AND PRACTICES IN THE LIGHT OF STUDY RESULTS

Introduction

The economic model of modern Western societies is largely based on mass, unsustainable production and consumerist lifestyles. This economic approach contributes to, among other things, environmental pollution, overconsumption of raw materials and depletion of natural resources, as well as to climate change, which, in light of current scientific knowledge, is largely anthropogenic in nature [IPCC, 2021: 6].

These negative phenomena should be counteracted by the reorientation of economic processes toward sustainable development. Its complementary elements are sustainable production and consumption, which represent a clear trend and strategic direction for the upcoming years. Indeed, market participants play a key role in initiating, animating and implementing the principles of sustainable development through their attitudes, decisions and market behavior, as well as self-regulation. This is reflected in a responsible and collaborative approach to the environmental protection and its resources management, particularly through the efficient allocation and use of resources, reducing the consumption of raw materials, most notably scarce and non-renewable ones, introducing the principle of circularity by giving a second life to products, recycling and introducing closed cycles, and, in the case of production, applying highly efficient processes that minimize pollution and waste [European Commission, b.d.].

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Adapting production to such requirements implies a shift away from traditional sources of customer value (mainly cost-based competitive advantage), and establishing revenue streams for companies, and thus driving change in current business models. On the consumer side, on the other hand, a significant phenomenon of reducing over-consumption, known as deconsumption, is emerging. This trend is particularly evident in the apparel industry, which is considered as particularly problematic in terms of environmental challenges.

Deconsumption refers to voluntary consumer behaviors aimed at reducing consumption. It is accompanied by such phenomena as dematerialization, servitization or shared consumption. According to T. Zalega, deconsumption is not just a trend in consumer behavior, but a new paradigm in the functioning of societies [Zalega, 2018: 30]. Socially responsible companies should therefore integrate the paradigm of sustainable consumption and production, as well as the concept of deconsumption in their activities, and support these initiatives by taking an active role, including offering innovative product and process solutions, as well as consumer education.

The aforementioned conclusions led the author to consider the possibility of reconfiguration of the model of perishable production and consumption within the context of Polish market. Accordingly, the aim of the article is to identify sustainable, innovative activities of B2C companies in Poland, with a particular focus on the environmental component, including their areas and forms, based on traditional literature review, desk research method as well as an original qualitative study. The following research questions were formulated for these purposes: RQ1: What is the relevance of innovation activity of enterprises on the B2C market for sustainable development? RQ2: What is the current state of innovative activities of B2C enterprises on the Polish market?

1. Theoretical background

Sustainable development has become a central topic in both public discourse and scientific debate. It has been established as a key strategic objective for the upcoming years, as outlined in the UN General Assembly resolution *Transforming our world: 2030 Agenda for Sustainable Development* (2030 Agenda). A prominent figure in initiating and implementing sustainable development principles, alongside public authorities and institutions, are private market players.

Sustainable production strategies and management practices implemented by companies, along with operational activities including product and process innovations, enable a pro-environmental transformation of business processes. These initiatives can also play a vital role in creating added value for the customer and building a competitive position in the enterprise. Consumer-focused companies

should also get involved in the process of sustainable development by introducing innovative products and process solutions and educating consumers in the context of sustainable consumption.

Point 28 of the 2030 Agenda emphasizes the crucial importance of increasing scientific, technological and innovative capacities for the transition to more sustainable consumption and production patterns [United Nations, 2015], while M. Urbaniec and M. Kramer [2009: 79] stress that achieving sustainable development requires fundamental changes that concern not only energy-producing technologies but also the provision of goods, while promoting economic, technological, economic and structural innovations.

The fact that 2021 has been declared the International Year of the Creative Economy for Sustainable Development emphasizes the priority of creating sustainable consumption and production models through innovation: using new technologies and business potential. This also reflects recognition of the critical role that consumer market participants and their innovative activities play in advancing sustainable development [UNIC Warsaw, 2021].

Innovation is defined in various ways in the literature; however, the vast majority of definitions emphasize its relative nature. For instance, M. Rogers defines that innovation is "anything that is perceived by an individual as new, regardless of the novelty of the idea or thing in question" [Przychodzeń, 2019: 27]. According to Ph. Kotler, innovation refers to any goods, services or ideas that are perceived by someone as new [Przychodzeń, 2019: 27]. This author points out that such an idea or concept may have existed for a long time, but it constitutes an innovation for the person who perceives it as new [Przychodzeń, 2019: 27]. Moreover, it should be pointed out that although innovations may arise within enterprises - and economic practice offers numerous examples - a large part of them emerges outside the enterprise and is implemented either through imitation or purchase of ready-made solutions. This may be determined with the lack of favorable conditions for conducting R&D activity, e.g., limited or no access to funding or other resources, including appropriately qualified staff. Such model of innovation process based on cooperation with external parties and/or access to external resources is referred to as open innovation.

The open innovation model is characterized by an orientation towards knowledge acquisition and/or sharing, a reliance on a response system linked to the consumer and other third agents, ensuring continuity in the innovation process [Przychodzeń, 2019: 27]. Open innovation in the context of the consumer goods market can be identified with the category of prosumption, including marketing innovations related to value co-creation with customers, crowdsourcing or peer production. Prosumers involved in the value co-creation process within a company are a very valuable resource for market-oriented companies, providing feedback or sharing their own ideas, concepts

and suggestions for improvements as well as participating actively in innovation process during conceptual, prototyping and/or testing phase.

Innovative activities of B2C enterprises include marketing innovations, process improvements, new business models as well as R&D. Since innovations introduced by enterprises on the B2C market are strongly driven by consumer needs and aimed at enhancing satisfaction through the introduction of new or improved products, extended services or additional usability for the end user, they primarily focus on marketing innovations.

Marketing innovations are defined as new marketing methods that involve significant changes in product design, its placement and promotion or pricing. –In the context of sustainable development, examples of such innovations include green/organic marketing and active engagement of enterprises in educating consumers and enhancing pro-environmental and pro-social, responsible attitudes (education-based marketing or social marketing) [Sulton, Sawabi, 2022: 387]. Consumer education and information-oriented activities also include environmental reporting (green reporting). Another noteworthy concept in marketing management, in the context of introducing innovations, involves solutions based on value co-creation with the customer [Mandolfo, Chen, Noci, 2020: 1].

Sustainable process innovations primarily relate to the evolution from mass-production systems, toward gradual flexibilization and transformation to deferred production systems, enabling the realization of individualized customer expectations, as stated by K. Czaplicka-Kolarz and M. Kruczek [2013: 64]. In addition to that, important trends include the implementation of Lean Manufacturing principles, process optimization and eco-efficiency, strategies based on sustainability, ecological life cycle assessment (LCA), internalization of external costs and environmental management, in accordance with ISO 14040:2006 and ISO 14044:2006 standards.

Spychalska-Wojtkiewicz and Tomczyk [2018: 69–70] noted that challenging and dynamic conditions in a company's environment induce them to be more radical toward innovations, often leading to the emergence of innovative business models. A similar observation was made by R.M. Grant, who pointed out that despite the general perception of innovation through the prism of products and/or processes, it is strategic innovation - introducing new approaches to doing business through novel business models - that serves as the main source of competitive advantage for companies [Przychodzeń, 2019: 27]. According to H. Chesbrough and R.S. Rosenbloon, a business model includes decisions on: (1) buyer value, (2) target market segment, (3) value creation chain structure, (4) cost structure, (5) company positioning, (6) competitive strategy [Spychalska-Wojtkiewicz, Tomczyk, 2018: 71–72].

As Witkowski points out, an organization's commitment to sustainable development can be evolutionary (incremental) in nature, progressing gradually, starting with the reduction of pollution and resource use (minimization), through the

implementation of programs aimed at cleaner production and improved efficiency (eco-efficiency, optimization), and ultimately to adopting an integrated, responsible approach to doing business, directed to maintain economic, environmental and social balance [Witkowski, 2008: 308].

Another proposal for sustainable business models was put forward by Bocken et al. [2014: 42–56] who, on the basis of a literature review, distinguished eight archetypes of sustainable business models. These include approaches focused on maximizing material and energy efficiency, creating value from waste, substituting renewable energy sources and natural processes, adopting a stewardship role or encouraging self-sufficiency.

The highest contribution to the creation of added value and thus customer value in the consumer goods market is made by manufacturing companies. They are responsible for developing, designing and producing consumer goods that meet consumers' needs and expectations, such as food, shelter, clothing, are mainly fulfilled through the acquisition and consumption of material goods. However, a certain proportion of these can be met through services, as reflected in the megatrend of the servitization of consumption.

According to OECD [2023] data, manufacturing companies consistently demonstrate higher level of innovation compared to service firms. This advantage applies to both product and process innovation, as well as overall innovation activity, which determines their further innovative potential.

2. Methods

The empirical study presented in this paper was carried out as the second stage of a research project on the phenomenon of deconsumption conducted between 2021–2022. The project comprised two stages: the first focused on consumer research, and the second on enterprise-level analysis, embedding the concept of deconsumption within sustainable economic models, sustainable consumption and production frameworks.

The initial stage of the research project aimed to identify the key determinants and models of deconsumption-oriented consumer behavior, i.e., the intentional reduction of the level of consumption. It manifests itself especially in its quantitative dimension, including decreased purchases volume and reduced consumption of material goods, as well as in the dematerialization of consumption, exemplified by usage models that do not require ownership.

The consumer survey conducted in the initial stage served as the basis for determining the substantive scope of the enterprise survey. It examined the manifestations and forms of the phenomenon, taking into account the market behavior of consumers,

as well as by identifying the subjective opinions of respondents on the challenges of deconsumption, including those related to the current production model. Such perspective is consistent with the principles of open innovation and consumer-centric strategies, characteristic for B2C innovations.

For instance, it was noted that the model of reducing non-durable consumption by consumers can significantly drive innovation, both in terms of product development and marketing innovations, as well as induce companies to adopt process innovations oriented towards ecological optimization, such as reducing resource consumption or minimizing negative environmental effects, since deconsumption often aligns with ecological reorientation of consumption patterns. Thus, it plays a key role in fostering the implementation of innovative, green business models.

In the second stage of the research project, a company-focused study was conducted to evaluate selected issues around sustainable practices and sustainable innovation in companies on the B2C market, based on the conditions identified in the consumer survey. This study presents the results of the second stage of the research project, focusing on the innovation activities of companies.

A quantitative survey in the form of a questionnaire was conducted by a research institute between 21st and 26th of September 2022 on a sample of N=205 respondents aged 18–65, who are active employees of manufacturing, service and trading companies on the B2C market in Poland. The sample was selected using a random-quota and based on full-time employment criteria. The sample ensured the following minimum representation by company per type of capital:

- domestic capital - at least 85 interviews,
- foreign capital - at least 35 interviews,
- mixed capital - at least 35 interviews.

The above amounts were based on two key assumptions: (1) according to secondary data, a synthetic indicator of the share of companies with foreign capital in the Polish economy reached 37.1% in 2019 [Polish Economic Institute, 2021: 3]; (2) the sample structure was designed to enable statistical tests to be performed for comparisons between individual groups of enterprises, taking into account the sample size of ± 200 participants.

The research tool was an authorial questionnaire administered using CAWI method (Computer Assisted Web Interview) via an online panel. A research institute provided substantive and technical support during the stage of development and programming of the online interview questionnaire and carried out implementation checks in compliance with ESOMAR and PTBRIO standards, as well as preparing the result tables. The CAWI interview questionnaire was programmed using CADAS software.

In the first part of the questionnaire, respondents were asked to answer 10 demographic and employment related questions, including: gender, age and type of

employment. Additional questions addressed the origin of company capital (domestic, foreign, or mixed), industry sector (production, trade, services), size of the enterprise (1–9 employees, 10–49 employees, 50–249 employees, or more than 250 employees), and the macro-region where the enterprise is located (based on CSO classification: Northern, Mazowieckie Voivodeship, Eastern, Central, Southern, South-Western, North-Western). Respondents were also asked about geographical scope of their company's activity (national, international).

In the core section, 10 questions were designed to capture opinions on selected issues related to sustainable innovation activities, corresponding to consumer research outputs. These areas included:

- Use of resources (use of renewable energy sources, sustainable use of non-renewable energy sources, use of secondary raw materials, reuse of raw materials in subsequent production cycles);
- Optimizing processes to reduce resource waste;
- Reducing the amount of energy and materials consumed per unit in production;
- Changes in production technologies (recycling of materials, waste management, introduction of closed-loop cycles);
- Introducing eco-friendly products and solutions (conducting research and development to optimize resource use, product development, extending product life cycles);
- Consumers collaboration (value co-creation);
- Product strategies (labelling, certification, reducing unnecessary packaging, offering extended product – warranty service);
- Pricing strategies (internalization of external costs, favorable payment terms);
- Distribution strategies (sustainability of logistics chains and their optimization, recycling, deposit systems);
- Promotion strategies (consumer education, reporting, marketing communication);
- Business model innovations.

The questionnaire incorporated various response formats, therefore multiple analysis methods were applied:

1. In case of closed-ended answers:
    a. Single choice (yes / no / don't know) – statistical analysis using the logistic model and Wald statistics;
    b. Single-choice rated on a 5-point Likert scale – statistical analysis using Chi-square and V–Cramer statistics;
    c. Multiple choice – statistical analysis using logistic model and Wald statistics.

3. Findings and discussion

The quantitative survey was conducted to identify the nature of companies' activities in the context of sustainable practices. It encompassed functional-area practices with a particular focus on marketing management and innovation activities, responsible management, and sustainable business model archetypes.

Among marketing practices, the predominant focus was on reducing unnecessary and excessive product packaging, in line with the concept of minimalism, as indicated by 67% of respondents. The next most frequently cited statements concerned the introduction of environmentally friendly products and solutions (62.93%), the integration of sustainable values in marketing communication (56.59%), and the offering of guarantee and maintenance services beneficial to the consumer (55.61%). These initiatives reflect the core assumptions and postulates of green marketing and, to some extent, promote deconsumption through services supporting the product's lifespan and long-term use. Nearly half of respondents also declared engaging in CSR reporting and taking actions to educate employees about ecology (approx. 54% each), cooperation with consumers in the field of value co-creation (53.17%) and taking actions to educate consumers about ecology (49.76%). The least frequently cited practice was obtaining organic and/or Fair Trade certification (38.54%).

Respondents in the study were asked whether they undertake R&D activities to support their innovation potential in sustainable development – specifically focusing on environmentally friendly products and solutions and extending product life cycles. These activities were declared by 34.15% of respondents (2.16 times more likely to occur for manufacturing companies compared to service companies) and 33.17% of respondents (manufacturing companies less likely than service companies), indicating a relatively low level of involvement compared to the other surveyed practices and suggesting an adaptive approach to product innovation. At the same time, such results may indicate specialization in the context of sustainability related to R&D activities - manufacturing companies are more involved in the development of products with lower environmental footprint, while service-oriented companies are involved in the development of services that extend the life cycle of such products.

The results of the applied statistical tests indicate on lower probability of the occurrence of the investigated events (undertaken by companies in the investigated areas) for manufacturing companies in relation to service companies (for each of them, the odds ratio in the logistic models was below one, with service enterprises used as the reference group) for the following areas in turn:

- cooperation with consumers ($\exp(\hat{\beta}) = 0.355$),
- possession of environmental and/or Fair Trade certification ($\exp(\hat{\beta}) = 0.537$),
- introduction of environmentally friendly products and solutions ($\exp(\hat{\beta}) = 0.353$),

- reduction of unnecessary product packaging ($\exp(\hat{\beta}) = 0.383$),
- offering favorable guarantees and services as part of the extended product ($\exp(\hat{\beta}) = 0.238$).

These finding could be supported to some extent by the existing literature. For instance, Li, Kankanhalli, & Kim [2016] indicated that firms operating in the ICT sector are often the pioneers in launching consumers' innovation communities. At the same time, the results of a survey conducted by the Statistics Poland (GUS) revealed that 9.8% of industrial enterprises and 9.7% of service enterprises considered cooperation with customers (compared to other partners of the company) in 2012–2014 as the most beneficial for their innovative activities [Dolińska, 2016]. Nevertheless, it should be noted that, according to Eurostat studies, the main sources of innovation for Polish companies are internal - within the company or corporate group - while customers rank third, following conferences, fairs and exhibitions. Although this distribution mirrors patterns observed in other EU countries, the proportion of firms citing customers as the source of innovation is significantly lower in Poland than in most EU countries [Szul, 2016]. In reference to eco-certification, it is worth to mention that EU Ecolabel official statistics show that out of the total 2 983 licenses issued, most remain in the following product groups: tourist accommodation services (26%), hard surface cleaning products (13%), and indoor cleaning services (8%) [European Commission, 2024a].

Despite the recent growth of eco-innovation activities across Europe, environmental issues remain as a main development challenge and implies the necessity of changes in current economic and business model, as advocated, for example, by the EU Open Innovation Strategy Group [Curley, Samelin, 2013]. Therefore, the study sought to identify whether the activities of the companies in the sample could be attributed to sustainable business models, using conceptualization presented by Bocken et al. [2014].

The largest group in the study consisted of organizations that could not be assigned to any of the sustainable business model archetypes (46%), followed by 31% pursuing hybrid models, and 23% of companies representing single sustainable model archetypes. Among the largest group representing hybrid models, there was a predominance of those that were a combination of two (13%), while smaller proportion integrated three (8%), four (3%) or all five (6%) of the aforementioned archetypes, indicating a high degree of commitment, materializing in a holistic approach to sustainable production and responsible management. The most common combination of archetypes was the simultaneous creation of value from "waste" and maximizing material and energy efficiency, with renewable energy and natural process substitution at the lowest level.

Organizations that adopted a single sustainable business model exclusively represented a relatively small group, distributed across the following archetypes:

1. Model focused on maximizing material and energy efficiency (7% of responses) – mainly observed among companies with predominantly domestic capital and domestic operations.
2. Model centered on the creating value from "waste" (7% of responses) – more common among enterprises with predominantly domestic capital, followed by those with foreign or mixed capital, a slight predominance of micro-enterprises (up to 9 employees), and companies operating within the domestic market.
3. Stewardship model (5% of responses) – exclusively adopted by enterprises with predominantly domestic capital, typically medium-sized or large enterprises (50–249 employees, and over 250 employees), with operations within the domestic market.
4. Model based on the substitution of renewable energy sources and natural processes (1% of responses) – more prevalent among enterprises with predominantly domestic capital, followed by foreign or mixed capital, predominance of medium-sized enterprises, and companies with national scope of operations.
5. Model promoting self-sufficiency (1% of responses) – evenly distributed among enterprises with predominantly national, mixed and foreign capital, slight predominance of companies with over 250 employees, and those operating nationally.

Conclusions

Results of the study partially confirm the previous findings, for instance, moderately low level of innovation activity declared by respondents in the survey coincides with the result of the 2024 Eco-Innovation Index, where Polish companies rank among the lowest performers within EU economies, placing them in the Eco-I catching up group (together with Bulgaria, Romania, Cyprus) [European Commission, 2024b].

According to the study, the activities of companies in the area of sustainable innovation primarily focus on the implementation of management methods corresponding with the lean management philosophy, optimizing production processes in terms of resource utilization and eliminating post-production waste through clean production methods. Equally important are marketing activities aimed at developing ecological products, improving packaging and distribution methods, as well as ensuring marketing communication to promote the concept of sustainable consumption and production. However, according to European Commission [2024b], Poland's 2024 Eco-Innovation Index position is mostly attributed to low performance in three key indicators: eco-innovation related academic publications, water productivity (GDP per total freshwater abstraction), value added in environmental protection and resource management activities, which somewhat stays in opposition to these findings.

From a practical point of view, particular attention should be paid to ESG reporting, declared by 53.65% of respondents, including 54.80% of medium-sized

and 64.86% of large companies. According to Directive 2014/95/EU it is mandatory from 1 January 2024 for companies with an average annual workforce exceeding 500 employees and meeting at least one of the following financial criteria: balance sheet total of EUR 20,000,000 or net sales revenue of EUR 40,000,000. In light of such legislative requirements, preparing companies for financial reporting can be considered a priority action in the context of sustainability communication activities. The second area of strategic importance in the context of marketing activities is the process of obtaining organic and Fair Trade certification, which was reported at the lowest level by the surveyed respondents. The strategic importance of such activities should be considered from two perspectives:

(1) addressing the low level of consumer confidence towards green and sustainable marketing practices,
(2) complying with the legislative conditions under the proposed draft of Green Claims Directive by the Council of the European Union, which aims to regulate the environmental labelling of products in the common market, thus preventing greenwashing.

The larger scale of solutions related to the circularity in the coming years will undoubtedly be influenced by the EU legislative initiatives related to Directive 94/62/EC, which was replaced in 2022 by the Regulation on Packaging and Packaging Waste. This regulation sets ambitious targets, including a 15% reduction in packaging waste by 2040 and a ban on single-use packaging. In Poland, circular economy provisions were implemented through an amendment adopted in June 2023 to the Packaging and Packaging Waste Management Act (commonly referred to as the Deposit Act), according to which a deposit system will be in place starting 2025. This system will be mandatory for large-scale establishments exceeding 200 square meters, while others will be able to join on a voluntary basis. In view of the legislative changes indicated, the reorientation of manufacturing processes and logistics systems towards GOZ will become a strategic priority in the area of functional management, especially in the largest companies.

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ECO-INNOVATIONS OF B2C COMPANIES IN POLAND: DIAGNOSIS OF AREAS, FORMS AND PRACTICES IN THE LIGHT OF STUDY RESULTS

Abstract

Transition to a green economy remains simultaneously one of the main development goals and a challenge on different levels for the following years. It is widely recognized that actions of consumer market participants, both enterprises, as well as individuals, play a crucial role in driving this transformation. This trend induces business-to-consumer (B2C) companies toward pro-environmental reorientation, reflected in innovative products and process solutions as well as implementing sustainable business models. The aim of the article is to examine the sustainable innovation initiatives undertaken by B2C companies in the Polish market,

focusing on the environmental component. For this purpose, a quantitative survey was conducted on a sample of N=205 employees from consumer market companies, utilizing an authorial survey questionnaire. The survey covers practices in the areas of marketing, R&D, as well as selected operational and responsible management sectors, which were contrasted with the archetypes of sustainable models as defined by Bocken et al. The statistical analysis included Chi-square tests and the V–Cramer measure, as well as logistic model and Wald statistics to assess the significance and strength of the variables influencing the adaptation of the practices addressed in the study.

Keywords: green innovations, marketing innovations, innovative business models, B2C innovations

JEL Classification Codes: O310, O360, Q560

EKOINNOWACJE PRZEDSIĘBIORSTW B2C W POLSCE: DIAGNOZA OBSZARÓW, FORM I PRAKTYK W ŚWIETLE WYNIKÓW BADANIA

Streszczenie

Przejście na zieloną gospodarkę pozostaje jednocześnie jednym z głównych celów rozwojowych i wyzwaniem na różnych szczeblach na kolejne lata. Powszechnie uznaje się, że działania uczestników rynku konsumenckiego, zarówno przedsiębiorstw, jak i osób fizycznych, mają kluczowe znaczenie dla tej zmiany. Skłania to firmy z sektora B2C (*business-to-consumer*) do prośrodowiskowej reorientacji działalności, materializującej się w innowacyjnych rozwiązaniach produktowych i procesowych oraz wdrażaniu zrównoważonych modeli biznesowych. Celem artykułu jest diagnoza zrównoważonych działań innowacyjnych firm B2C na polskim rynku, ze szczególnym uwzględnieniem komponentu środowiskowego. W tym celu przeprowadzono badanie ilościowe na próbie $N = 205$ pracowników firm rynku konsumenckiego z wykorzystaniem autorskiego kwestionariusza ankiety. W badaniu uwzględniono praktyki z obszaru marketingu, badań i rozwoju, a także wybrane praktyki operacyjne i odpowiedzialnego zarządzania, które zestawiono z archetypami zrównoważonych modeli według Bockena et al. Analiza statystyczna obejmowała testy Chi-kwadrat i miarę V–Cramera, a także model logistyczny i statystykę Walda do oceny istotności i siły wpływu zmiennych na występowanie praktyk uwzględnionych w badaniu.

Słowa kluczowe: zielone innowacje, innowacje marketingowe, innowacyjne modele biznesowe, innowacje B2C

Kody klasyfikacji JEL: O310, O360, Q560