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DIAGNOSIS OF THE APPLICATION OF RENEWABLE ENERGY SOURCES IN AGILE ORGANIZATIONS – ANALYSIS OF OWN RESEARCH

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Purpose: The aim of the article is to present a balance of benefits and risks related to the use of renewable energy sources in agile organizations and to identify dominant social attitudes towards such solutions. The analysis is set in the context of the growing importance of sustainable development and energy transformation.
Design/methodology/approach: A quantitative method was used, based on a survey conducted among 820 respondents in January–February 2025. The data was subjected to multivariate correspondence analysis (MCA), which allowed for visualization of relationships between responses and extraction of patterns of assessments.
Findings: Respondents mostly positively assess the impact of renewable energy sources on the environment, climate, job market and energy independence, while expressing moderate concerns about costs and uncertainty about potential side effects. MCA analysis revealed a convergence of positive attitudes and a dispersion of critical assessments.
Research limitations/implications: The study was cross-sectional and relied on declarative opinions of respondents, which limits the ability to capture changes in attitudes over time. The industry and geographic specificity of the organizations surveyed was also not taken into account.
Practical implications: The study was cross-sectional and based on respondents' declarative opinions, which limits the ability to capture changes in attitudes over time. The industry and geographical specificity of the organizations studied was also not taken into account.
Social implications: The article highlights the importance of social acceptance for the development of renewable energy sources and the need to support energy transformation through dialogue, education and transparency.
Originality/value: The study brings new value by combining the perspective of organizational agility with the issue of renewable energy sources, pointing out their potential synergy and impact on the sustainable development strategy.
Keywords: agile organizations, renewable energy sources, sustainable development.
Category of the paper: research paper.

1. Introduction

In the face of increasing climate challenges and growing expectations for environmental responsibility, organizations that bear the hallmarks of agile face the need to combine operational flexibility with the implementation of sustainable development goals. One of the integral areas of this transformation is the implementation of renewable energy sources. They can support energy independence, reduce the carbon footprint and build long-term organizational value. Despite the growing interest in this topic, there is still a lack of in-depth analyses showing how agile organizations perceive the benefits and risks associated with the use of renewable energy.

The article addresses this issue by combining theoretical perspectives with the results of empirical research conducted among 820 respondents. The added value of the study is to show social assessments and attitudes towards the use of OER in organizations with an agile management structure. This allows for a better understanding of the potential and barriers of this transformation.

The structure of the article includes a theoretical part, which is devoted to the idea of sustainable development and renewable energy sources in agile organizations. Then, a balance of benefits and threats is presented, and in the following part, an analysis of the research results, conclusions and recommendations.

The originality of this study lies in the combination of two areas that are usually analyzed separately: agile management and the use of renewable energy sources (RES). In the existing literature, RES are primarily treated as a technological or environmental issue. In contrast, this article attempts to situate them within the structural and organizational context specific to agile organizations. The presented research addresses a cognitive gap by showcasing social perceptions of the benefits and risks associated with implementing RES in such organizations. A topic that has rarely been the subject of empirical analysis to date. The approach to data analysis is also innovative. The use of Multiple Correspondence Analysis (MCA) enabled the identification of relationships between qualitative variables and the extraction of dominant perception patterns. This gives the study both an exploratory and an applied character.

1.1. The idea of sustainable development in agile organizations

The idea of sustainable development in agile organizations has become a response to the need to integrate environmental, social and economic goals with management practices that are based on flexibility, adaptability and innovation (Reyes-Mercado, 2023). Sustainable development is understood as striving for a balance between the needs of current and future generations. This concept is increasingly used in organizations operating in a dynamic market environment. Such conditions force them to respond quickly to changes, while taking into account social and ecological responsibility (Wüstenhagen, Menichetti, 2012).

In agile organizations, characterized by short decision-making cycles, an iterative approach to achieving goals, and an organizational culture based on learning and collaboration, sustainability can be considered an integral element of the strategy (Wells, Lin, 2024). It is not understood as a separate field. It is defined as a set of principles that permeate all levels of the organization's functioning: from operational planning, through human resources management, to innovation and investment policy (Reyes-Mercado, 2023). Integrating the principles of sustainable development with agile management practices promotes the creation of business models that respond to market needs while minimizing negative impact on the environment and supporting social development (Wüstenhagen, Menichetti, 2012; Devine-Wright, 2007).

Sustainable development and organizational agility are two approaches that increasingly complement each other. Agile companies, thanks to their flexibility and quick response to change, are well positioned to implement solutions that support environmental protection and social responsibility. Instead of treating sustainable development as a separate area, they incorporate its principles into everyday operations – from planning and team management to investment decisions. As a result, they can not only reduce their environmental impact but also gain the trust of customers and partners, and in the long term, build a competitive advantage. Combining agility with the idea of sustainable development helps organizations better prepare for the challenges of energy transformation and growing social expectations.

Organizational agility allows for rapid implementation of environmentally friendly solutions, such as renewable energy sources, circular economy or digitalization of processes that reduce resource consumption (Roy, 2024; Styczynski, 2024). High adaptability also allows for effective response to growing stakeholder expectations regarding social responsibility and transparency of actions (Van der Waal et al., 2019). In this aspect, sustainable development becomes a practice embedded in everyday operations, which are constantly monitored, assessed and improved in agile organizations (Wüstenhagen, Menichetti, 2012).

Sustainability in agile organizations should also be supported by digital and analytical tools. They enable ongoing assessment of the impact of the organization's activities on the environment and implementation of improvements in real time (Roy, 2024; Rosario, Raimundo, 2021). Technologies such as artificial intelligence, blockchain or the Internet of Things can be effectively used to increase energy efficiency, monitor carbon footprint or support responsible supply chains (Wüstenhagen, Menichetti, 2012).

Thus, technological agility becomes an integral determinant that supports the implementation of sustainable development goals. The concept of sustainable development in agile organizations does not only mean focusing on elological aspects. It also includes actions for equal opportunities, inclusiveness, employee well-being and social involvement (Reyes-Mercado, 2023; Wells, Lin, 2024). An agile organizational structure promotes the formation of a work environment based on shared responsibility, autonomy and continuous development of competencies. This results in increased social capital and organizational resilience.

As a result, sustainable development in the sense of agility becomes both a goal and a way of functioning of the organization in conditions of uncertainty and transformation. Taking into account the principles of sustainable development in the agile management model allows for building a competitive advantage, but also for increasing the social legitimacy of the organization's activities. This takes on integral importance in conditions of increasing regulatory pressure and growing consumer awareness (Wüstenhagen, Menichetti, 2012; Devine-Wright, 2007; Wells, Lin, 2024). In the long term, the synergy between agility and sustainable development can lead to the creation of resilient, ethical and innovative organizations, bearing the characteristics of agile. Such organizations can harmoniously combine operational efficiency with responsibility towards the environment (Reyes-Mercado, 2023).

1.2. Using Renewable Energy Sources in Agile Organizations

The use of renewable energy sources in agile organizations can be considered an important determinant that effectively supports their ability to flexibly respond to changing external conditions, as well as a tool for implementing a long-term development strategy. In the turbulent market conditions in which modern organizations operate, adaptability becomes both a factor of competitive advantage and a condition for survival. In this aspect, the implementation of technologies based on renewable energy sources allows an agile organization to achieve greater energy autonomy, as well as to optimize costs in the long term by reducing the risk associated with external price and regulatory shocks (IRENA, 2023; Tester et al., 2012; REN21, 2023).

The decentralization of decision-making and incremental approach to implementing innovations, characteristic of agile organizations, favor testing and gradual implementation of RES solutions, which include photovoltaic installations, heat pumps, energy storage systems, and microgrids (Roy, 2024). This approach allows for rapid adaptation to local conditions, scaling solutions depending on implementation results, and engaging employees in the technology adaptation process. This certainly increases their acceptance and efficiency of use (Jobert, Laborgne, Mimler, 2007; Sovacool, Ratan, 2012). Agile project management methodologies, based on iterative cycles of action, also allow for ongoing monitoring of the effectiveness of RES solutions and their corrections without the need to suspend the entire process (Haggett, 2011).

The use of renewable energy sources in agile organizations also helps to redefine the relationship between technology and organizational structure. Energy solutions based on prosumer models, intelligent energy management systems and integration with digital data platforms contribute to reducing the environmental footprint. They also allow for the generation of new sources of value that can be integrated with basic business processes. For example, the possibility of automated control of energy consumption depending on changing environmental conditions can be correlated with production planning, logistics or resource

management systems. This in turn leads to higher operational efficiency (Tester et al., 2012; Ansolabehere, Konisky, 2016).

The implementation of renewable energy in agile organizations also takes on a cultural and symbolic dimension. Investing in pro-ecological solutions can be considered an expression of responsibility and commitment to achieving goals that go beyond economic interests. This certainly strengthens stakeholder trust and contributes to building a positive image of the organization (Funk, 2023; Leiserowitz et al., 2025; Devine-Wright, 2007). In an organizational culture based on transparency, cooperation, and value orientation, which characterizes agile organizations, green transformation activities can be considered a natural extension of the management philosophy. Renewable energy functions here both as a technical resource and, at the same time, as a carrier of values and an integral part of the organizational identity (Fast et al., 2016; Sovacool, Ratan, 2012).

The use of renewable energy sources in agile organizations also creates an open space for creating cross-sector partnerships and developing local innovation ecosystems. The flexibility of structures and the ability to quickly prototype solutions lead to closer cooperation with technology providers, energy startups, research institutions and public administration (Gkeka-Serpetsidaki, 2024; Eleogu, Okonkwo, Daraojimba, 2024). Such connections support implementation processes, promote knowledge sharing, allow for testing new business models and the development of solutions adapted to local realities and needs (REN21, 2023; Haggett, 2011).

In conclusion, the use of renewable energy sources in agile organizations affects the overall organizational transformation. It includes both the modernization of infrastructure, as well as changes in the approach to management, relations with the environment and defining organizational values. In this approach, RES become a catalyst for innovation and an impulse for deeper reflection on the role of the organization in the processes of shaping a sustainable future (Tester et al., 2012; Ansolabehere, Konisky, 2016; Grant, Green, Mason, 2024).

1.3. Renewable Energy Sources in Agile Organizations – Balance of Benefits and Risks

The turbulence and unpredictability of the business environment means that organizations that want to maintain their competitiveness and ability to survive in a dynamic environment reach for solutions consistent with the idea of sustainable development. The implementation of renewable energy sources allows to reduce the impact of activities on the climate, as well as increase the energy independence and operational resilience of the organization (Wells, Lin, 2024). Technologies based on renewable energy are a real answer to the need to reduce risks related to fluctuations in fossil fuel prices, instability of raw material supplies or regulatory pressure. For agile organizations, whose attribute is flexibility and rapid adaptation, renewable energy is an important component of the long-term development strategy (Wells, Lin, 2024).

In an agile management model, an iterative approach and decentralized decision-making structures play an integral role. Such an organizational architecture promotes a culture of innovation in a gradual manner and adapted to local conditions. Renewable energy solutions, including photovoltaic installations, heat pumps, local energy storage or micro-grids, should be implemented on a pilot basis, tested and scaled depending on the results obtained (Gkeka-Serpetsidaki, 2024; Letcher, 2020). Such practices promote greater efficiency while increasing the level of acceptance of new technologies among employees. In addition, the use of agile methods allows for ongoing monitoring of implementation results, rapid identification of barriers and introduction of corrections without the need to suspend entire processes (Letcher, 2020).

The use of renewable energy in such organizations transforms the relationship between technology and operational structure. Modern energy management systems, integrated with digital tools and data platforms, allow organizations to reduce emissions, but also generate new value that supports business processes (IRENA, 2018; Batel, Devine-Wright, Tangeland, 2013). Thanks to solutions such as smart energy grids or automatic energy consumption control systems, it is possible to effectively manage production, logistics or resource use (IRENA, 2018; Jacobson et al., 2015; Styczynski, 2024).

There is also a cultural dimension to investing in renewable technologies. Pro-environmental activities strengthen the reputation of the organization and emphasize its commitment to social responsibility. This is reflected in a positive perception by stakeholders (Twidell, Weir, 2021; Gkeka-Serpetsidaki, 2024; Ellabban, Abu-Rub, Blaabjerg, 2014). In an organizational culture based on values, trust and cooperation, such decisions become a natural extension of the organizational mission. Renewable energy also becomes a carrier of meanings and an expression of organizational identity (Huijts, Molin, Steg, 2012; Hall, Ashworth, Devine-Wright, 2013).

Renewable energy sources are undoubtedly an impulse for building relationships between different sectors. Agile organizations, thanks to their openness to implementing innovations, are able to quickly engage in partnership initiatives. They engage technology suppliers, energy startups, research institutes and public administration (Larson, Lewis, 2023). Such mutual cooperation accelerates the process of implementing innovations, and also promotes the exchange of knowledge and the creation of common values (Wüstenhagen, Menichetti, 2012; Letcher, 2020; Van der Nat et al., 2024). Thanks to the flexibility of operation, it is possible to quickly adapt solutions to local needs and conditions. In addition, it can increase employment in the energy sector and support the development of competences in new professional areas (Twidell, Weir, 2021; Styczynski, 2024).

The implementation of RES in agile organizations leads to profound changes in the technological field, but also in the management and culture. The implementation of such solutions promotes the modernization of infrastructure, the reconstruction of business models

and the redefinition of relations with the environment (Wüstenhagen, Menichetti, 2012; Wells, Lin, 2024).

Renewable energy sources bring many strategic benefits, but it is also worth remembering that they require taking into account potential challenges. On the benefits side, the main benefits are the positive impact on the natural environment and climate, increased energy independence, the possibility of creating new jobs and improving the image of the organization as responsible and modern. On the other hand, there are also concerns, especially related to the initial investment costs, the potential increase in energy prices and the uncertainty about the impact of some technologies on human health and the environment. This balance requires careful management, implementation of agile management methods and support for implementation processes through education, transparency of actions and involvement of stakeholders.

1.4. Research Methodology

The aim of the conducted research was to identify the perception of benefits and threats related to the use of renewable energy sources in an agile organization. The basic assumption was to determine how respondents assess the impact of such solutions on the natural environment, the labor market, energy independence and economic and health aspects. The research aimed to deepen knowledge about social attitudes towards energy transformation, with particular emphasis on aspects important for organizations operating in the agility model. A research hypothesis was formulated, according to which the use of renewable energy sources in an agile organization is perceived by respondents as a solution that brings mainly environmental, social and strategic benefits, while taking into account concerns related to the potential increase in energy costs and possible side effects.

The research sought answers to questions about how respondents assess the impact of renewable energy sources on environmental protection, combating climate change, energy independence and the labor market. Attention was also paid to the assessment of potential threats, such as harmfulness to human health and the environment or an increase in energy prices. The research method used was a survey conducted in the period from January to February 2025 on a sample of 820 respondents. The data obtained as a result of the survey were then analyzed using the Multiple Correspondence Analysis technique. The aim of using this method was to identify relationships between qualitative variables and to capture response patterns, which allowed for a graphical presentation of the relationships in a two-dimensional space. The choice of MCA allowed for a better illustration of the patterns of perception of individual aspects of the use of renewable energy sources and facilitated the interpretation of multifactorial relationships between the attitudes of respondents.

In order to ensure interpretative consistency and enhance the validity of the respondents' answers, selected terms used in the survey were accompanied by explanatory notes. The term "energy independence" was defined as the reduction of an organization's or a country's reliance on external energy suppliers, particularly fossil fuels, in favor of local and renewable solutions.

The term “harmful to the environment” was explained in the questionnaire as the potential negative impact of RES technologies on ecosystems, landscape, soil, water or air quality, as well as interference with natural habitats. Such clarification aimed to reduce the risk of ambiguous interpretations and improve the reliability of the collected empirical data.

1.5. Presentation of Research Findings

The research aimed to diagnose the use of renewable energy sources in an agile organisation by analysing the opinions of 820 respondents (Table 1).

Table 1.
Diagnosis of the use of renewable energy sources in an agile organization – benefits and threats (N = 820)

	Definitely not	I don't think so	I have no opinion	I guess so	Definitely yes
It helps protect the natural environment	68	44	110	363	235
Combats climate change	81	87	115	278	259
It helps reduce dependence on imported energy resources	90	39	80	347	264
It provides new jobs	86	44	79	270	341
It causes an increase in energy prices	87	46	105	315	267
It is harmful to the environment	71	41	77	369	262
It is harmful to humans	81	43	131	341	224

Study: own.

Table 1 presents the distribution of 820 respondents’ answers to seven statements, taking into account a five-point rating scale. In the case of the statement that renewable energy sources help protect the natural environment, the largest number of respondents selected the answer “rather yes” – 363 people, followed by “definitely yes” – 235. Only 68 people definitely denied this statement, and 44 selected the answer “rather no”. 110 people declared no opinion.

For the statement on combating climate change, the answers were slightly more evenly distributed. 278 respondents indicated “rather yes” and 259 – “definitely yes”. Negative answers (“definitely no” and “rather no”) were given by 81 and 87 people, respectively, while 115 people remained undecided. With regard to reducing dependence on imported energy resources, 347 people considered it to be rather true, and 264 – definitely yes. “Definitely no” and “rather no” answers were given by 90 and 39 respondents, respectively. 80 people expressed no opinion.

In the context of creating new jobs, as many as 341 respondents strongly agreed with the statement, and 270 – rather yes. Negative answers were given by 86 ("strongly no") and 44 ("rather no") survey participants, respectively, while 79 people had no opinion. In relation to the possible impact of renewable energy sources on the increase in energy prices, the largest number of people – 315 – indicated the answer "rather yes", and 267 – "strongly yes". 87 people were strongly against this view, and 46 considered it rather untrue. The answer "I have no opinion" was selected by 105 respondents.

The question about the potential harmfulness of renewable energy sources for the environment was met with mainly positive responses in the sense of denying the thesis – 369 people stated that it was rather yes, and 262 – that it was definitely yes, which indicates a conviction about the lack of harmfulness. Negative answers – "definitely no" and "rather no" – were given by 71 and 41 respondents, respectively. 77 people remained undecided. Finally, in the case of the statement about the harmfulness of renewable energy sources for humans, 341 people indicated the answer "rather yes", and 224 – "definitely yes", which in this case should also be understood as rather a lack of agreement with the thesis. Negative answers to the statements – "definitely no" and "rather no" – were given by 81 and 43 respondents, respectively, while 131 people had no formed an opinion.

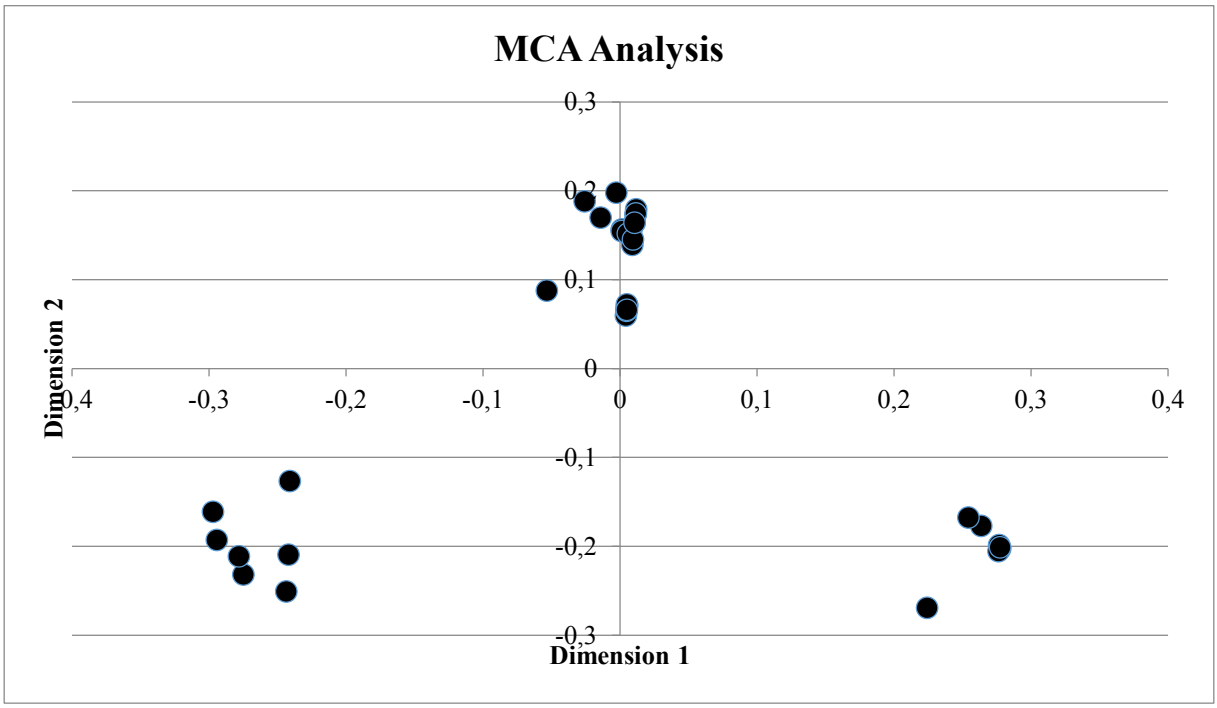

Figure 1. MCA analysis.

Study: own.

Figure 1 presents a graphical interpretation of multivariate correspondence analysis, used as a tool for dimension reduction and visualization of complex relationships between respondents' answers on the use of renewable energy sources in an agile organization. The analysis was conducted based on data from Table 1, which presents the distribution of 820 people's answers to seven statements regarding both the benefits and potential threats resulting from the implementation of such solutions.

The purpose of using MCA analysis was to simplify the structure of qualitative data by transforming it into a two-dimensional space, enabling the identification of response patterns and relationships between individual categories. Thanks to this method, it was possible to illustrate which responses are correlated and to what extent certain statements are perceived in a similar way by the study participants.

Figure 1 shows the distribution of response categories (such as “Strongly agree”, “Rather disagree”, etc.) for each of the statements in Table 1 along two dimensions. The horizontal axis (Dimension 1) and the vertical axis (Dimension 2) represent the main factors differentiating respondents’ attitudes. The coordinates of the points correspond to specific combinations of responses and illustrate their interrelationships and semantic distances. The closer the points corresponding to specific responses are to each other, the more similar they are in terms of the patterns of respondents’ assessments.

It is observed that certain categories of answers cluster in the graph space, which may indicate the existence of common perceptions or dominant narratives regarding certain aspects of renewable energy sources. For example, positive evaluations of benefits, such as environmental protection, combating climate change or creating jobs, may be grouped in one part of the graph, while answers indicating threats or concerns, such as potential harm or increased costs, may be grouped in another. This structure allows for the detection of not only the general trend, but also subtle differences in the perception of individual issues.

Applying MCA to the data in Table 1 therefore enables a better understanding of the internal dynamics of the ratings and common response patterns, which is a valuable complement to traditional tabular analysis. This enables a deeper interpretation of the results and the identification of potential attitudinal segments among the study population.

2. Discussion

The results of the conducted research allow for the formulation of several important conclusions concerning the perception of the use of renewable energy sources in an agile organization. Based on the respondents' declarations, there is a clear conviction about the dominant benefits that result from the implementation of such solutions. Respondents most often indicated the positive impact of natural energy sources on the protection of the natural environment. Combating climate change was also important. A significant part of the respondents also considered that their use promotes energy independence by reducing dependence on resource imports. It can also be an impulse for the creation of new jobs.

Despite the fact that the main assessments were positive, the existing fears and scepticism were not ignored. Some respondents expressed the belief that the implementation of renewable energy sources could lead to an increase in energy costs. In turn, questions concerning the harmfulness to the environment and people were mostly met with answers suggesting a lack of such concerns. Nevertheless, the presence of undecided people indicates a certain level of uncertainty or lack of sufficient knowledge in this area.

The interpretation of the distribution of responses in the tabular analysis indicates a clear trend of pro-ecological and pro-modern opinions. Respondents overwhelmingly perceive the strategic importance of energy transformation. They also identify it with activities consistent with the goals of sustainable development. This attitude may result from the growing social awareness of ecology, as well as from the narrative observed in the public debate, which promotes green transformation as an opportunity, not a burden for organizations and societies. The use of multidimensional correspondence analysis allowed for an in-depth interpretation of the interdependencies between the responses. The MCA graph showed that positive responses to statements of a beneficial nature (environmental protection, combating climate change, creating jobs, energy independence) are grouped in a two-dimensional space in a relatively coherent manner. This confirms their mutual connection in the perception of respondents. It also indicates that people who perceive one benefit are very likely to indicate the others as well. In turn, responses concerning threats, although they are generally less frequent, are distributed in a more dispersed manner, which suggests a less uniform assessment of these aspects. This may indicate that potential threats are not perceived as dominant or unambiguous.

The presence of a significant number of neutral responses, especially in relation to controversial aspects such as the increase in energy prices or the harmfulness of technology, indicates the need for further social education and providing reliable information on the real effects of implementing renewable energy sources. Neutrality in responses may also mean a lack of a well-established opinion or uncertainty resulting from insufficient knowledge of the subject. In light of the data obtained, it can be stated that the social perception of renewable energy sources in the aspect of an agile organization is clearly positive and oriented towards benefits, both environmental, strategic and social. At the same time, certain areas of uncertainty are noticeable , which may constitute a challenge in the process of implementing these solutions, but also a starting point for shaping a more effective communication and educational policy in the field of energy transformation.

Based on the obtained research results and formulated conclusions, it seems reasonable to formulate recommendations supporting organizations in effective and responsible implementation of renewable energy sources in the agile management model. First of all, it is worth emphasizing that the dominant positive attitude among respondents towards energy transformation creates favorable conditions for initiating pro-environmental activities. Therefore, organizations are recommended to actively use social acceptance as a resource that supports the implementation of RES technologies and as an element of building reputation and social responsibility.

Due to the benefits perceived by respondents in the form of increased employment and increased energy independence, it is reasonable to integrate the strategy of investment in renewable energy sources with a long-term sustainable development policy and local economic initiatives. The introduction of energy solutions can be perceived as an ecological necessity, but also as a tool for developing employee competences and a source of innovation and

competitive advantage. In this aspect, the creation of new job roles supporting both the implementation and ongoing maintenance of RES systems is of particular importance. The uncertainty and neutrality in the responses observed among some respondents, primarily in relation to potential threats and costs, indicates the need to increase the transparency of communication and education among planned investments. It is recommended that organizations undertake information activities aimed at dispelling fears related to alleged harmfulness or increased costs, presenting empirical data, benefits resulting from the use of renewable energy sources and good practices. These activities should be directed to both employees and local communities and external stakeholders.

In addition, taking into account the different attitudes towards risk and the complexity of assessing innovative technologies, it is recommended to use participatory and consultative methods. They enable the voice of employees and business partners to be aligned in the decision-making process. Building an open dialogue around renewable energy can increase trust, raise the level of involvement in the transformation process and minimize employee resistance. Finally, in light of the MCA analysis, which showed the interconnections between positive assessments of various aspects of renewable energy sources, it is recommended to formulate coherent communication narratives that combine ecological, social and economic benefits into a single message system. This approach increases the chances that the organization will be perceived as modern, agile, responsible and at the same time well-prepared for the challenges of the future.

To enhance the practical applicability of the research findings, a structured, phased model for implementing renewable energy sources in agile organizations has been proposed. The first stage involves diagnosing internal organizational capacities and assessing the level of technological and cultural readiness for energy transformation. The second stage assumes the implementation of pilot projects in selected units or locations, with the use of monitoring and evaluation tools. The third stage focuses on scaling up proven solutions, integrating them with existing management systems, and simultaneously conducting educational activities addressed to employees and external stakeholders. The fourth stage concerns long-term innovation and risk management, based on iterative improvement of solutions and the development of partnerships supporting sustainable development.

From the perspective of future research, it is worth considering the use of qualitative methods. Such approaches would allow for capturing more subtle factors, such as individual motivations or concerns related to the implementation of renewable energy sources within agile organizations. This type of analysis could complement the obtained quantitative results and provide a deeper understanding of respondents' attitudes. It also seems justified to broaden the research scope to include other industries and to take into account geographical and cultural differences. This would enable a more comprehensive understanding of the local contexts in which green solutions are implemented. Longitudinal studies would bring additional value,

as they allow for tracking changes in attitudes over time, particularly in light of evolving energy policies and the development of environmental technologies.

3. Conclusions

Comparing the research results with the findings of other researchers, one can see both similarities and differences in the perception of renewable energy sources. The respondents taking part in the study clearly emphasized the positive impact of renewable energy sources on environmental protection, combating climate change, energy independence and the situation on the labor market. Similar trends were observed in studies conducted internationally. Funk (2023) indicates that the development of alternative energy sources is a key priority for societies, and energy transformation is perceived as a desirable direction of development. The convergence of these observations is also confirmed by the research of Leiserowitz et al. (2025), in which respondents are in favor of a wider use of renewable energy. This is undoubtedly related to concern for the environment and energy security.

The perception of renewable energy sources as a factor supporting the development of the labor market is also reflected in the literature. According to the findings of the International Renewable Energy Agency, this sector is developing dynamically and generating demand for new skills and jobs. This is an important argument for organizations deciding to invest in low-emission technologies (IRENA, 2023). In our own study, respondents also showed a tendency to perceive RES as a development opportunity for the labor market. It can be concluded that the social understanding of the energy transformation goes beyond the purely ecological perspective and also includes economic issues.

At the same time, both in our own research and in the literature on the subject, certain concerns and uncertainties related to the implementation of RES are noticeable. This is particularly noticeable in the aspect of possible costs or side effects. In some cases, respondents expressed a neutral position towards statements about the potential harmfulness of the technology or the impact on energy prices. This indicates a lack of a clear opinion or insufficient knowledge. Funk (2023) also indicates that despite the general support for energy transformation, caution appears in the context of changes that could affect the current way of life and thus arouse uncertainty. Sovacool et al. (2012) also note that despite the fact that the majority of respondents do not see significant health risks associated with RES, a small number of respondents report concerns, especially regarding wind and photovoltaic technologies.

Analyzing the aforementioned comparisons, it can be stated that a positive social attitude towards renewable energy sources is obtained both on a local scale and on a global scale. This indicates a growing acceptance of energy transformation as a solution beneficial from the environmental, strategic and social point of view. At the same time, there is a noticeable need

to continue educational and communication activities that can dispel doubts and simultaneously build more conscious and stable attitudes towards the implementation of renewable energy sources in social and organizational structures.

The limitations of the conducted research mainly concerned the declarative nature of the collected data, which was based on the subjective opinions of respondents. This may be associated with the risk of declarative social compliance. In addition, the study was cross-sectional, which makes it impossible to capture changes in attitudes over time and their dependence on dynamic external factors, such as the economic situation or energy policy. The selection of the sample, although large, did not take into account geographical or industry diversity. This may limit the possibility of generalizing the results to all types of organizations operating in the agile model. Additionally, the five-point scale used did not allow for capturing more nuanced attitudes and reasons behind the selection of individual answers.

Future research directions may focus on in-depth analysis of barriers related to the implementation of renewable energy sources in different types of organizations and on the analysis of motivations, taking into account the industry context, culture and local regulatory conditions. It also seems reasonable to conduct longitudinal studies that would allow for capturing changes in attitudes over time and their dependence on external factors such as climate policy, economic situation or technological progress. It is also worth expanding the research to include the perspective of organizational decision-makers and operational employees. This will allow for a multidimensional assessment of the organization's readiness for energy transformation. Additionally, it is advisable to use qualitative and mixed methods, which will allow for a better understanding of the contexts, intentions and hidden mechanisms influencing decisions regarding investments in renewable energy sources.

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