

## **INTELLECTUAL PROPERTY AS AN ELEMENT OF ESG STRATEGY IN SMEs: A LITERATURE REVIEW AND RESEARCH DIRECTIONS**

**Aldona Małgorzata Dereń<sup>1\*</sup>**

<sup>1</sup> Wrocław University of Science and Technology, Faculty of Management, Poland


**Abstract:** Growing social and regulatory pressures to conduct sustainable business have intensified the integration of ESG (Environmental, Social, and Governance) principles into corporate strategies. Recognized as a strategic asset, Intellectual Property (IP) increasingly supports the implementation of sustainability goals, especially in small and medium-sized enterprises (SMEs). The main aim of this research is to identify how IP management contributes to ESG performance in SMEs. Using a comprehensive literature review and analysis of empirical examples from Polish and international SMEs, the study identifies five mechanisms linking IP and ESG: eco-patenting, open-source licensing, knowledge reporting, servitization, and inter-organizational collaboration. These mechanisms support the achievement of Sustainable Development Goals (SDGs) 4, 7, 10, 12, 13, 16, and 17. The results reveal that, despite the growing awareness of IP–ESG synergies, significant research gaps remain concerning their effectiveness in resource-constrained firms. The study concludes by proposing directions for empirical research and managerial practices aimed at integrating IP strategies with sustainability objectives to enhance competitiveness and global value creation.

**Keywords:** corporate strategy, development goals, ESG, intellectual property, SMEs, sustainable

**JEL Classification:** 031, L26, M14

---

<sup>1</sup> Aldona Małgorzata Dereń, DSc, PhD, Associate Prof., [aldona.deren@pwr.edu.pl](mailto:aldona.deren@pwr.edu.pl),

 <https://orcid.org/0000-0002-2377-4573>

\* Corresponding author: Aldona Małgorzata Dereń, [aldona.deren@pwr.edu.pl](mailto:aldona.deren@pwr.edu.pl)

## Introduction

Over the past decade, growing social and regulatory pressures have pushed businesses to align with sustainable development principles (Eccles & Klimenko, 2019). ESG frameworks, centered on environmental responsibility, social inclusiveness, and transparent governance, have become integral to corporate sustainability. For resource-constrained SMEs, ESG implementation poses both challenges and opportunities to enhance resilience and competitiveness (Wang et al., 2025). Intangible assets, especially intellectual property (IP), are increasingly viewed not only as tools for protection and commercialization but also as strategic enablers of ESG-driven innovation and knowledge transfer (Holgersson & Aaboen, 2019; WIPO, 2024). Patents, trademarks, copyrights, trade secrets, and industrial designs can support eco-friendly technologies, improve transparency, and foster social innovation. However, the mechanisms linking IP to ESG in SMEs remain underexplored, limiting both theoretical insight and practical guidance. This article reviews the existing literature to examine how IP can function as a strategic asset for ESG integration in SMEs, identifies key mechanisms, presents practical case studies, and proposes directions for future research.

## Theoretical background

The relationship between intellectual property (IP) management and environmental, social, and governance (ESG) performance can be interpreted through several complementary theoretical perspectives, primarily the Resource-Based View (RBV), the Dynamic Capabilities Theory, and the Knowledge-Based View (KBV). Together, these frameworks conceptualize IP as a strategic resource and enabler of sustainable transformation within small and medium-sized enterprises (SMEs).

### Intellectual property as a strategic asset

According to the Resource-Based View (RBV), intellectual property (IP) is a key intangible asset that can generate a sustainable competitive advantage when it is valuable, rare, inimitable, and embedded within the organization (Barney, 1991; Dereń & Skonieczny, 2024). Beyond its protective role, strategic IP management supports commercialization, innovation partnerships, and alignment with corporate strategy (Lima & Santos, 2018). Well-managed IP portfolios help SMEs capture innovation value, attract investment, and strengthen market positioning. The Dynamic Capabilities Theory (Teece, 2007) complements this view by highlighting IP's role in organizational adaptability. Through the creation and reconfiguration of knowledge assets, firms can respond to technological and regulatory shifts. Patents, trademarks, and industrial designs act as dynamic capabilities that enable eco- and social innovations aligned with ESG goals (Holgersson & Aaboen, 2019). For example, patenting sustainable technologies or inclusive business models allows firms to protect and share ESG-oriented knowledge. From the Knowledge-Based View (KBV), IP serves as a repository and conduit for organizational knowledge, supporting its codification, transfer, and sharing across networks (Grant, 1996). IP tools structure innovation

processes and document know-how, facilitating collaboration and diffusion. Through joint R&D, IP-driven alliances, and open innovation platforms, firms can accelerate the spread of sustainable practices. Licensing low-emission technologies or using open-source models fosters cross-sector cooperation and amplifies environmental and social impact. Ultimately, IP is not just a legal safeguard; it is a strategic driver of ecosystemic innovation and collaborative, sustainable development.

### **ESG and SMEs**

The ESG framework assesses enterprise performance across three dimensions: environmental stewardship, social responsibility, and corporate governance. Initially driven by compliance requirements, ESG has evolved into a strategic imperative, shaped by increasing regulatory pressure, investor scrutiny, and stakeholder expectations. For SMEs, which constitute the backbone of most economies, ESG adoption presents both opportunities and challenges. Resource constraints, lack of formalized procedures, and limited awareness of IP management often hinder systematic integration of sustainability principles (Holgersson, 2013; Sakiewicz et al., 2024; Dereń & Skonieczny, 2024). Moreover, many SMEs face difficulties in measuring and reporting ESG impacts due to the absence of standardized tools and frameworks. Nevertheless, SMEs possess inherent strengths – flexible structures, close stakeholder relationships, and entrepreneurial orientation – that enable faster adaptation to ESG demands (Povolná, 2019). In this context, intellectual property becomes a catalyst for sustainable transformation. By protecting innovations, facilitating technology transfer and encouraging collaborative innovation, IP allows SMEs to align economic objectives with environmental and social responsibilities. For example, eco-patenting supports low-carbon transitions, open licensing fosters social inclusiveness and equitable access to technologies, and IP transparency contributes to responsible governance and ESG reporting. Integrating IP with ESG frameworks enhances SMEs' ability to generate shared value – economic, environmental, and social – while simultaneously strengthening their resilience, reputation, and competitiveness. This alignment not only supports the achievement of the Sustainable Development Goals (SDGs) but also underscores the role of IP as a strategic enabler of sustainable innovation ecosystems. Viewed through this lens, intellectual property management becomes a vital component of sustainable business strategy, embedding ESG considerations into the core of SME competitiveness and long-term growth.

### **Methodology**

This study is based on the principles of a systematic literature review (SLR), aimed at identifying, evaluating, and synthesizing current research on the relationship between intellectual property (IP) management and environmental, social, and governance (ESG) performance in small and medium-sized enterprises (SMEs). The methodological framework was developed in accordance with the PRISMA 2020 guidelines, ensuring the transparency and replicability of the research process.

## **Research objectives and questions**

The main objective of this review is to examine how IP management strategies influence ESG performance in SMEs and to what extent they align with the Sustainable Development Goals (SDGs). To address this aim, the following research questions were formulated:

- RQ1. How does strategic intellectual property management affect ESG performance in SMEs?
- RQ2. What mechanisms link IP management with environmental and social outcomes?
- RQ3. What research gaps exist in current studies on IP–ESG integration?

## **Inclusion and exclusion criteria**

To ensure relevance and quality, the review included peer-reviewed articles (2010-2025) in English, focused on IP management, ESG practices, or sustainability in SMEs – both conceptual and empirical. Excluded were non-peer-reviewed sources, unrelated studies, duplicates, and publications focused solely on large corporations. These criteria ensured the selection of high-quality, SME-relevant literature.

## **Search strategy and selection process**

The literature search was conducted in major academic databases such as Scopus, Web of Science, and Google Scholar, using combinations of the following keywords: “intellectual property”, “ESG”, “sustainability”, “SMEs”, “patents”, and “innovation governance”. The initial search identified 356 records. After removing duplicates, 294 unique articles remained. Based on title and abstract screening, 212 publications that did not meet the inclusion criteria were excluded. The full texts of the remaining 82 articles were reviewed in detail, resulting in a final sample of 47 studies included in the review. Although the selection process is not presented in a visual PRISMA diagram, the description above clearly reflects the stages of identification, screening, and inclusion of records.

## **Data extraction and analysis**

Key variables were extracted from each study: publication year, methodology, geographical context, type of intellectual property, ESG dimension addressed, and main findings. Thematic analysis identified mechanisms linking IP management with ESG outcomes, such as eco-patenting, open licensing, knowledge sharing, and servitization. To enhance reliability, source triangulation was applied by including case studies and reports from WIPO and OECD. The analytical framework covered concepts like “intellectual property”, “ESG”, “sustainable development”, “SMEs”, “patents”, and “open innovation”. Content analysis focused on the recurring mechanisms through which IP influences ESG, with particular attention to synergies between environmental, social, and governance dimensions in promoting sustainable SME development.

## Mechanisms linking intellectual property and ESG in SMEs

The integration of intellectual property (IP) with ESG objectives is becoming a core element of sustainable development strategies in SMEs. In response to rising stakeholder expectations, regulatory demands, and the need for resilience, SMEs increasingly seek tools that combine innovation with social and environmental responsibility. IP now functions not only as a protective asset but also as a strategic integrator of ESG values within business models, supporting both operational and strategic alignment with sustainable development goals. Research confirms the relevance of intellectual capital in this context. Gross-Gołacka et al. (2020) show that human and structural capital in Polish SMEs support sustainability strategies. Vimalnath et al. (2023) emphasize that a Responsible IP Strategy fosters inclusivity, value co-creation, and ESG alignment. Hernández-Chea et al. (2020) introduce the SBM-IP Canvas, linking IP forms to sustainable business model components. Hanel (2008) demonstrates that SMEs apply different IP tools depending on their resources and technological maturity. While limited financing or legal expertise may constrain patent use, even partial IP management enhances innovation, collaboration, and ESG-oriented adaptation. Five key mechanisms emerge from the literature and case studies. Collaboration with universities, NGOs, research institutions, and corporations strengthens SMEs' absorptive capacity and access to resources (Suchek & Franco, 2024; Zahoor & Al-Tabbaa, 2020; Wang et al., 2025). Joint IP management – via co-ownership, cross-licensing, and open platforms – facilitates knowledge exchange, risk reduction, and innovation scaling, contributing to SDG 9 and SDG 17. Table 1 summarizes these mechanisms, illustrating how IP advances ESG goals in SMEs.

**Table 1. Mechanisms linking intellectual property and ESG in small and medium-sized enterprises**

Mechanism	Description	Examples	Supported SDGs	Key ESG functions	References
Patenting Environmentally Friendly Technologies	Protecting and commercializing eco-friendly innovations, e.g., energy efficiency, renewable energy, and circular economy solutions	ML System S.A. – solar-generating glass for building-integrated photovoltaic; Bioelektra Group – RotoSTERIL waste processing technology	SDG 7, 12, 13	Environmental impact, technological innovation, corporate reputation	Tundang (2025); PAP Biznes (2024); Bioelektra Group (2024)
Open-Source Licensing and Knowledge Sharing	Providing free access to technologies and knowledge to promote social inclusion, innovation, and technology diffusion	Migam.org – open-source tools for sign language translation	SDG 4, 9, 10	Social inclusion, innovation ecosystem development, cost reduction	Holgersson & Aaboen (2019); Migam.org (2025)

Mechanism	Description	Examples	Supported SDGs	Key ESG functions	References
Knowledge Management and IP Reporting	Systematic management of IP-related knowledge and integration with ESG reporting, including lifecycle monitoring and environmental impact assessment	Innovation lifecycle tracking, technology impact reports	SDG 16	Transparency, ethical governance, corporate responsibility, strategic decision support	WIPO (2024); Chen & Wang (2024)
Product and Service Servitization	Transforming product sales into service models (e.g., rental, subscription, pay-per-use) to extend product lifecycle and reduce resource consumption	Rental of energy-efficient machinery, subscription-based software	SDG 12	Resource efficiency, long-term customer relationships, innovative business models	Chen & Wang (2024)
Interorganizational Collaboration and Technological Alliances	Partnerships with universities, NGOs, research institutions, and corporations to enhance absorptive capacity and jointly manage IP	Co-ownership of patents, cross-licensing, joint innovation platforms	SDG 9, 17	Knowledge transfer, risk reduction, innovation ecosystem building, resilience to market and systemic changes	Suchek & Franco (2024); Zahoor & Al-Tabbaa (2020); Wang et al. (2025)

Source: Own study based on research

### Patenting environmentally friendly technologies

Intellectual property, especially patents, is a vital tool for protecting technological innovations and enabling their commercialization. From an ESG perspective, patenting sustainable technologies like energy-efficient systems, renewables, or circular economy solutions allows SMEs to actively support ecological transformation. Well-managed patent portfolios enhance transparency, value creation, and alignment with the Sustainable Development Goals (Tundang, 2025). Polish SMEs increasingly combine IP with ESG strategies, generating measurable business, social, and environmental benefits. ML System S.A. develops patented solar glass for building-integrated photovoltaics, contributing to SDG 7 and SDG 13 (PAP Biznes, 2024).

### Open-source licensing and knowledge sharing

Open-source licensing offers an alternative to traditional IP protection by enabling free access to technologies and knowledge, fostering broad dissemination. For SMEs, this model supports social inclusion, innovation, and technology diffusion aligned with ESG principles (Holgersson & Aaboen, 2019). A notable example is Migam.org (2025), which provides open-source sign language translation tools,

contributing to SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities). Beyond brand visibility, open licensing serves strategic and operational roles, accelerating innovation, reducing R&D costs, and shortening the time-to-market. It enhances knowledge transfer among firms, academia, and user communities, boosting SMEs' absorptive capacity and innovation ecosystems. It also mitigates legal risks in niche tech areas and reinforces corporate social responsibility. Firms adopting open licenses are seen as responsible innovators, especially when sharing eco-friendly or educational technologies. This approach expands the market reach without high investment, builds engaged user communities, and supports SDGs like education (SDG 4), reduced inequalities (SDG 10), and industrial innovation (SDG 9). Ultimately, open licensing strengthens SMEs' strategic positioning while embedding ESG values into daily operations.

### **Knowledge management and IP reporting**

Effective IP-related knowledge management goes beyond documentation and protection; it includes monitoring innovation use, assessing environmental impact, and integrating IP data into ESG reporting. This involves systems that track the full lifecycle of innovations, from invention to commercialization and evaluation of social and environmental outcomes. Incorporating data such as patent counts, license types, technology applications, and environmental contributions into ESG frameworks enhances transparency. Demiraj (2025) found that intellectual capital mediates ESG–financial performance links in U.S. IT firms, while Chen & Wang (2024) showed that digital transformation and servitization in Chinese SMEs improve ESG outcomes. Such practices help stakeholders assess a company's sustainability contributions (WIPO, 2024; Chen & Wang, 2024) and foster a culture of openness and accountability – especially vital for SMEs with limited resources. Systematic IP data analysis supports strategic decisions, identifies improvement areas, and forecasts innovation benefits. These efforts directly support SDG 16 by promoting ethical governance and transparency, while improving coordination across R&D, legal, and risk functions. Integrating IP into ESG reporting builds stakeholder trust and strengthens access to financing, partnerships, and market positioning.

### **Product and service servitization**

Servitization – the shift from selling products to offering services like rental, leasing, or subscriptions – is a strategic approach to sustainable resource management. By providing access to product functionality rather than ownership, companies can extend product lifecycles, reduce overproduction, and optimize resource use. Intellectual property plays a crucial role in enabling servitization. Patents protect technologies for monitoring, maintenance, and automation; copyrights and industrial designs secure user interfaces and documentation; trademarks build brand trust and signal service quality. These IP tools support scalable, secure, and competitive service delivery. For SMEs, servitization offers practical pathways to implement ESG principles. Wang et al. (2025) highlight how IP protection in service-based models

strengthens innovation and sustainability. For example, renting energy-efficient machinery instead of selling it reduces raw material consumption, waste, and logistics emissions – directly contributing to SDG 12 (Responsible Consumption and Production). Servitization also fosters long-term customer relationships through personalized services and co-development. It improves lifecycle management by facilitating upgrades, maintenance, and recovery, while lowering environmental costs and enhancing operational efficiency. Additionally, service models often rely on advanced IT systems, creating new opportunities to leverage IP in software, algorithms, and data management. For resource-constrained SMEs, servitization is not only a sustainable alternative to traditional sales but also a driver of innovation, flexibility, and social responsibility. By aligning business models with the ESG goals, SMEs can strengthen their market position and contribute meaningfully to sustainable development.

### **Interorganizational collaboration and technological alliances**

Collaboration with universities, NGOs, research centers, and large corporations is a key enabler for SMEs to implement social and environmental innovations aligned with ESG principles. These partnerships enhance SMEs' absorptive capacity – their ability to identify, assimilate, and apply external knowledge and technologies (Suchek & Franco, 2024; Zahoor & Al-Tabbaa, 2020; Wang et al., 2025). Given limited resources, such alliances provide access to expertise, infrastructure, and competencies that SMEs often cannot develop independently. Joint IP management plays a strategic role in these collaborations. Models like patent co-ownership, cross-licensing, shared innovation platforms, and open technology repositories facilitate knowledge exchange, reduce implementation risks, and ensure fair IP governance. This allows SMEs to actively engage in innovation while protecting their interests and improving their negotiation position with larger partners. From a sustainability perspective, interorganizational collaboration supports SDG 9 (Industry, Innovation, and Infrastructure) and SDG 17 (Partnerships for the Goals). Initiatives such as joint R&D projects, technology incubators, and regional innovation clusters help build resilient ecosystems that promote responsible innovation and local economic development. Moreover, these partnerships strengthen SMEs' adaptability to market shifts and systemic challenges, such as energy transition, digitalization, and regulatory changes. Joint IP strategies can also foster new business models that integrate economic goals with social and environmental values. Ultimately, interorganizational collaboration, supported by thoughtful IP management, helps SMEs embed ESG principles into their practices and contributes to broader systemic change toward more sustainable and inclusive business practices.

### **Integration of intellectual property and ESG in SMEs**

Effective integration of intellectual property (IP) with ESG principles requires both strategic intent and operational infrastructure. While research on intellectual capital and innovation in SMEs is expanding, systematic studies directly linking IP

protection with ESG performance remain scarce (Gross-Gołącka et al., 2020; Demiraj, 2025; Zhang & Xu, 2025; Wang et al., 2025). At the strategic level, SMEs should identify IP assets with potential for positive social and environmental impact – such as low-emission technologies, inclusive solutions, or innovations that enhance transparency in governance. This allows IP investments to be aligned with sustainable development priorities. Operationally, integrating IP with ESG involves implementing systems to monitor the lifecycle of innovations, frameworks for reporting technological impact, servitization models, and mechanisms for interorganizational collaboration (Holgersson & Aaboen, 2019; Wang et al., 2025). These tools help SMEs manage intangible assets more effectively and contribute to achieving the Sustainable Development Goals. Empirical studies support this approach. Hall and Helmers (2024) show that companies in the clean energy sector using open licensing and industry partnerships accelerate innovation diffusion and environmental impact, supporting SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action). Seebode (2012) highlights Philips' use of IP to scale medical technologies, such as mobile diagnostics and telemedicine, thereby expanding healthcare access and contributing to SDG 3 (Good Health and Well-being) and SDG 10 (Reduced Inequalities). Start-ups in the cleantech sector also demonstrate flexible IP strategies, combining patent protection with open licensing to scale innovations, attract partners, and increase accessibility (Chesbrough, 2020; Bogers et al., 2018). These practices foster innovation ecosystems where IP acts as a catalyst for collaboration and transformation rather than a barrier. In summary, integrating IP with ESG should be viewed not as a parallel process but as a unified strategy for value creation. When strategically managed, IP can support environmental, social, and governance goals while enhancing SME competitiveness, resilience, and reputation in a dynamic market environment.

## Discussion

The reviewed literature and case studies highlight intellectual property (IP) as a strategic enabler of ESG integration in SMEs. Its role extends beyond protecting innovations and enabling commercialization; it also supports social responsibility, governance transparency, and environmentally sustainable solutions. IP thus acts as a bridge between technological goals and sustainable development values, helping SMEs build a long-term competitive advantage through innovation and accountability. Despite the growing recognition of this potential, several research limitations remain. There is a lack of comprehensive empirical data on how IP strategies influence ESG outcomes in SMEs. Measuring the social and environmental effects of IP management is challenging, especially given SMEs' limited analytical and organizational resources. Many firms also lack tools to integrate IP data into ESG reporting, which hinders their ability to document and communicate the impact of innovation. From a theoretical standpoint, redefining IP as a value-creation tool aligns with the evolution of the Resource-Based View (RBV), Dynamic Capabilities Theory, and Knowledge-Based View (KBV). These frameworks emphasize the strategic role

of intangible assets in building adaptability and resilience. IP, as a knowledge repository and transfer mechanism, supports interorganizational learning, technological alliances, and collaborative innovation ecosystems. In practice, SMEs can use IP to enhance transparency, promote inclusiveness, and improve environmental performance. Tools such as patent lifecycle monitoring, open licensing for socially beneficial technologies, and servitization models help translate ESG goals into concrete business actions. This strengthens reputation, improves risk management, and facilitates access to financing and strategic partnerships. Therefore, integrating IP with ESG in SMEs should be seen as a multidimensional process – requiring both a shift in management thinking and the development of appropriate analytical and institutional tools. Further empirical, comparative, and sector-specific research is essential to better understand how IP–ESG strategies contribute to SME sustainability and resilience in a dynamic economic environment.

### **Directions for future research on IP–ESG integration in SMEs**

Although existing studies provide valuable insights into the role of intellectual capital and innovation in supporting ESG performance in SMEs, they often address only selected mechanisms. Prior research has largely focused on individual dimensions of intellectual capital, such as human or structural capital, without fully exploring the diverse forms of intellectual property (IP) and their differentiated impact across environmental, social, and governance pillars. Recent contributions (Gross-Gołącka et al., 2020; Giampaoli et al., 2025; Demiraj, 2025; Chen & Wang, 2024; Wang et al., 2025) emphasize the strategic relevance of intangible assets and innovation capabilities, yet stop short of offering a holistic assessment of how specific IP instruments contribute to ESG outcomes in SMEs.

This growing recognition of IP as a lever for sustainable transformation underscores the need for more robust and targeted empirical research. Future studies should aim to clarify the tangible influence of IP strategies on the realization of Sustainable Development Goals (SDGs) and the broader sustainability performance of SMEs. To advance this agenda, several key research directions emerge. First, the composition and structure of IP portfolios – encompassing patents, trademarks, copyrights, and industrial designs – should be examined in relation to ESG performance. Identifying which types of IP assets generate the greatest social and environmental value, and under what organizational or sectoral conditions, would provide critical insights for both scholars and practitioners. Second, the role of open innovation and technology diffusion deserves deeper investigation. Open-source licensing, knowledge-sharing platforms, and public–private partnerships may significantly enhance eco-innovation, particularly in sectors with a high environmental impact. Research should explore not only firm-level benefits but also the systemic outcomes related to sustainable industrial transformation. Third, there is a pressing need to develop quantitative indicators that capture IP’s contribution to ESG. Metrics such as innovation durability, accessibility of green technologies, and reductions in environmental externalities would enable a more precise evaluation and cross-sectoral comparison of IP strategies. Finally, the use of methodological triangulation, combining

quantitative, qualitative, and longitudinal approaches, would allow for a more nuanced understanding of how IP management practices influence ESG implementation. This would also help identify enabling factors that foster lasting synergies between innovation, social responsibility, and sustainable growth. By addressing these areas, future research can deepen our understanding of the dynamic interplay between IP and ESG in the SME context. Such insights will be essential for developing evidence-based recommendations for business leaders, policymakers, and other stakeholders seeking to harness intellectual property as a driver of sustainable development.

## Conclusions

The conducted literature review confirms that intellectual property can serve as a critical resource supporting the implementation of ESG strategies in small and medium-sized enterprises. Mechanisms such as patenting environmental technologies, open innovation, knowledge management, servitization, and interorganizational collaboration provide operational frameworks that enable the achievement of environmental, social, and governance objectives. At the same time, they strengthen SMEs' ability to build a competitive advantage based on innovation, flexibility, and responsibility. From a theoretical perspective, redefining IP as a tool for creating sustainable value represents a significant step toward integrating innovation management with concepts of social and environmental responsibility. From a practical standpoint, implementing IP strategies oriented toward ESG can enable SMEs to participate more effectively in global sustainable development agendas, such as the UN 2030 Agenda. Further research in this area, supported by collaboration between academia, the business sector, and public institutions, can contribute to the development of tools that facilitate the transformation of SMEs toward more responsible, innovative, and resilient business models.

## References

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120. DOI: 10.1177/014920639101700108
- Biolektra Group. (2024). Korzyści. Retrieved September 18, 2025 from <https://biolektra.com/pl/>
- Chen, D. & Wang, S. (2024). Digital transformation, innovation capabilities, and servitization as drivers of ESG performance in manufacturing SMEs. *Scientific Reports*, 14(1), 24516. DOI: 10.1038/s41598-024-76416-8
- Chesbrough, H. (2020). *Open innovation results: Going beyond the hype and getting down to business*. Oxford University Press.
- Demiraj, A. (2025). Exploring the mediating role of intellectual capital between ESG performance and firm financial outcomes: Evidence from U.S. technology companies. *Journal of Cleaner Production*, 465, 140892. DOI: 10.17261/Pressacademia.2025.1982
- Dereń, A. M., & Skonieczny, J. (2024). *Własność intelektualna w kształtowaniu strategii przedsiębiorstwa*. Difin, Warszawa.
- Eccles, R. G., & Klimenko, S. (2019). The investor revolution. *Harvard Business Review*, 97(3), 106-116. <https://hbr.org/2019/05/the-investor-revolution>
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(S2), 109-122. DOI: 10.1002/smj.4250171110

- Gross-Gońska, E., Kusterka-Jefmańska, M., & Jefmański, B. (2020). The relationship between intellectual capital and sustainable development – Is it a one-way street?. *Sustainability*, 12(4), 1545. DOI: 10.3390/su12041545
- Hall, B. H., & Helmers, C. (2024). *The Economics of Innovation and Intellectual Property*. Oxford University Press.
- Hanel, P. (2008). The use of intellectual property rights and innovation by manufacturing firms in Canada. *Economics of Innovation and New Technology*, 17(4), 285-309. DOI: 10.1080/10438590701581481
- Hernández-Chea, R., Vimalnath, P., Bocken, N., Tietze, F., & Eppinger, E. (2020). Integrating intellectual property and sustainable business models: The SBM-IP Canvas. *Sustainability*, 12(21), 8871. DOI: 10.3390/su12218871
- Holgersson, M. (2013). Patent management in entrepreneurial SMEs: A literature review and an empirical study of innovation appropriation, patent propensity, and motives. *R&D Management*, 43(1), 21-36. DOI: 10.1111/j.1467-9310.2012.00700.x
- Holgersson, M., & Aaboen, L. (2019). Intellectual property management in technology-based firms: From appropriation to utilization. *Technology Innovation Management Review*, 9(7), 12-23. DOI: 10.1016/j.techsoc.2019.04.008
- Lima, F. V. R., & Santos, J. A. B. (2018). Intellectual Property Management in Small and Medium-Sized Enterprises: A Systematic Literature Review. *International Journal for Innovation Education and Research*, 6(9), 109-127. DOI: 10.31686/ijer.vol6.iss9.1161
- Migam.org (2025). Aplikacja Migam – tłumacz języka migowego. <https://migam.org/aplikacja-migam/>
- PAP Biznes. (2024). *ML System SA (24/2024). Udzielenie Spółce patentu na wynalazek*. <https://biznes.pap.pl/wiadomosci/przemysl/ml-system-sa-402024-udzielenie-spolce-patentu-na-wynalazek>
- Povolná, L. (2019). Innovation strategy in small and medium-sized enterprises (SMEs) in the context of growth and recession indicators. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(2), 32. DOI: 10.3390/joitmc5020032
- Sakiewicz, P., Ober, J., & Kopiec, M. (2024). Perception of ESG standards implementation in Polish SMEs – Pilot study. *System Safety: Human – Technical Facility – Environment*, 6(1), 299-310. DOI: 10.2478/czoto-2024-0032
- Seebode, D. (2012). *Sustainable innovation: Exploring a new innovation paradigm*. <https://www.slideshare.net/slideshow/sustainable-innovation-exploring-a-new-innovation-paradigm/42416282>
- Suchek, N., & Franco, M. (2024). Inter-organisational cooperation oriented towards sustainability involving SMEs: A systematic literature review. *Journal of the Knowledge Economy*, 15, 1952-1972. <https://link.springer.com/article/10.1007/s13132-023-01196-x>
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350. DOI: 10.1002/smj.640
- Tundang, R. E. (2025). Aligning climate needs and intellectual property: An entitlement-based framework for green technology transfer. *Journal of International Economic Law*, 28(3), 441-459. DOI: 10.1093/jiel/jgaf030
- Vimalnath, P., Tietze, F., Eppinger, E., Jain, A., Gurtoo, A., & Elsen, M. (2023). Responsible intellectual property strategy for sustainability transition – An exploratory study. *World Patent Information*, 73, 102195. DOI: 10.1016/j.wpi.2023.102195
- Wang, X., Yusof, R. N. R., & Jaharuddin, N. S. (2025). Driving SMEs' sustainable competitive advantage: The role of service innovation, intellectual property protection, continuous innovation performance, and open innovation. *Sustainability*, 17(9), 4093. DOI: 10.3390/su17094093
- WIPO. (2024). *Intellectual property and SMEs: A guide for small and medium-sized enterprises*. <https://www.wipo.int/sme/en/>
- Zahoor, N., & Al-Tabbaa, O. (2020). Inter-organizational collaboration and SMEs' innovation: A systematic review and future research directions. *Scandinavian Journal of Management*, 36(2), 101109. DOI: 10.1016/j.scaman.2020.101109
- Zhang, A., & Xu, Y. (2025). Intellectual property protection and green technology innovation in enterprises: Evidence from China's manufacturing industry. *Advances in Management & Applied Economics*, 15(5), 119-144. DOI: 10.47260/amae/1557

**Authors' Contribution:** Aldona Małgorzata Dereń – 100%.

**Acknowledgements and Financial Disclosure:** The research used in this publication was not funded by external sources.

**Conflict of Interest:** The author declares no conflict of interest related to this publication.

**Ethics Declaration:** The research presented in the article did not require approval from an ethics committee.

**AI Declaration:** Artificial intelligence tools were used for English correction.

## WŁASNOŚĆ INTELEKTUALNA JAKO ELEMENT STRATEGII ESG W SEKTORZE MŚP – PRZEGLĄD LITERATURY I KIERUNKI BADAŃ

**Streszczenie:** Rosnąca presja społeczna i regulacyjna na prowadzenie działalności zgodnie z zasadami zrównoważonego rozwoju przyspieszyła integrację ESG (Environmental, Social, Governance) w strategiach przedsiębiorstw. Własność intelektualna (IP), jako kluczowy zasób strategiczny, coraz częściej wspiera realizację celów zrównoważonego rozwoju w małych i średnich przedsiębiorstwach (MŚP). Celem artykułu jest identyfikacja sposobów, w jakie zarządzanie IP przyczynia się do wyników ESG w MŚP. Na podstawie przeglądu literatury i analiz empirycznych wyróżniono pięć mechanizmów łączących IP i ESG: ekopatentowanie, licencjonowanie open-source, raportowanie wiedzy, serwicyzację oraz współpracę międzyorganizacyjną. Mechanizmy te wspierają realizację SDG 4, 7, 10, 12, 13, 16 i 17. Wyniki wskazują, że mimo rosnącej świadomości synergii między IP a ESG wciąż istnieją istotne luki badawcze dotyczące ich skuteczności w firmach o ograniczonych zasobach. Artykuł kończy się propozycją kierunków badań i praktyk menedżerskich wspierających integrację strategii IP z celami zrównoważonego rozwoju w sposób wzmacniający konkurencyjność i tworzenie wartości globalnej.

**Słowa kluczowe:** strategia korporacyjna, cele rozwoju, ESG, własność intelektualna, MŚP, zrównoważony rozwój

Articles published in the journal are made available under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Public License. Certain rights reserved for the Czestochowa University of Technology.

