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Technical Knowledge as a Determinant of ESG Implementation in the Electric Power and Transport Sectors

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Abstract:

Purpose: *This study examines the role of technical knowledge in the implementation of Environmental, Social, and Governance (ESG) strategies within the electric power and transport sectors—two industries critical to sustainable development and subject to increasing regulatory scrutiny under the European Green Deal.*
Design/Methodology/Approach: *Based on a survey of professionals from both sectors in Poland, the research explores ESG awareness, reporting practices, internal communication, and the involvement of technical personnel in ESG-related activities.*
Findings: *The results reveal a generally low level of ESG awareness and engagement across both sectors. A substantial proportion of respondents were unaware of whether their companies produce ESG reports, and many reported a lack of formalized ESG procedures or access to relevant information. Despite this, most respondents recognize the importance of ESG for corporate reputation and stakeholder trust, indicating a disconnect between perceived value and actual practice. Notably, respondents highlighted limited managerial involvement in ESG initiatives and a lack of systematic practices, such as energy monitoring or carbon footprint analysis. However, there is strong interest in ESG training, particularly among technical staff, suggesting an untapped opportunity for capacity building. The study also identifies a need for improved data standardization and the integration of operational knowledge into ESG reporting processes.*
Practical implications: *Recommendations include mandatory ESG training, the standardization of data collection and reporting, and a stronger role for technical teams in ESG strategy development. Additionally, the paper emphasizes the importance of leadership commitment and enhanced transparency toward both internal and external stakeholders. While ESG implementation remains nascent in the sectors studied, the findings highlight significant potential for progress. Leveraging technical expertise, improving communication, and institutionalizing ESG practices can strengthen organizational sustainability, compliance, and reputation.*
Originality Value: *The study contributes to the limited literature addressing ESG in these sectors and offers practical insights for advancing ESG maturity in industrial contexts.*

Keywords: *Technical knowledge, ESG implementation, electric power sector, transport sector, sustainability strategy.*

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1. Introduction

Environmental, Social, and Governance (ESG) regulations, introduced as part of the European Green Deal, exert a significant influence on socio-economic development. On one hand, industries such as transportation, freight forwarding, logistics, and energy have a profound impact on both the environment and society. On the other hand, enterprises operating within these sectors are required to adapt their strategies to meet ESG requirements, ensuring compliance with evolving environmental and social standards.

ESG represents a continuation of the concept of corporate social responsibility, gaining increasing importance in light of the expanding regulatory framework surrounding sustainable development, particularly at the European Union level. The use of the ESG acronym enables the precise definition of measurable criteria and parameters, thus facilitating a more analytical and structured approach to sustainability-related issues.

Climate change, the evolution of legislation, and shifting consumer expectations are all contributing to the growing necessity of embedding sustainability into corporate strategy. As such, ESG considerations are becoming an indispensable component of business operations, exerting a growing influence on corporate growth and international expansion. Increasing public awareness further enhances the role of ESG as a source of competitive advantage, both through the adaptation of internal processes and through enhanced transparency and accountability.

ESG regulations are profoundly shaping industrial sectors, including electric power and transport enterprises. While these industries exert considerable environmental and social influence, they are concurrently required to align their strategic activities with ESG criteria—particularly in terms of reporting environmental, social, and governance-related performance.

Implementing an ESG strategy necessitates the collection of relevant data, the deployment of new operational solutions, and the development of robust reporting systems. These systems must accurately reflect actions undertaken across environmental, social, and governance domains, in accordance with applicable standards. An effective ESG strategy not only addresses the intensifying regulatory requirements and consumer expectations but also fosters customer trust and attracts investment.

Companies that consistently implement ESG principles improve their operational efficiency, enhance market value, and secure long-term competitive advantage. This is particularly critical in environmentally impactful sectors such as energy and transportation, where responsible and sustainable practices play a pivotal role.

2. The Essence and Significance of ESG Reporting in the Electric Power and Transport Sectors

ESG, an acronym for Environmental, Social, and Governance, encompasses three pillars that define the directions of corporate responsibility. ESG indicators determine how a company contributes to sustainable development—not only through its core business activities but also through its broader impact on society and the environment. An increasing number of modern enterprises recognize the relevance of ESG in business, prioritizing responsibility and transparency. This approach is key to sustainable development, ensuring long-term viability in a competitive market while mitigating negative environmental and social impacts.

ESG represents a framework that enables companies to understand and measure their influence on the environment, social relationships, and internal governance structures. These criteria are designed to promote sustainable development, which entails balancing the needs of present and future generations, particularly in sectors such as energy and transport, through the following components:

- **Environmental:** Environmental criteria assess the impact of a company's operations on the natural environment. They include resource management, greenhouse gas emissions reduction, waste and pollution management, and energy efficiency. Companies that successfully implement ESG-related environmental strategies often reduce their environmental footprint, which can lead to lower operational costs, improved reputational standing, and compliance with regulatory requirements. Environmental stewardship is a central element of ESG. The ESG framework helps companies identify potential environmental risks and supports efforts to minimize adverse environmental effects of their operations.

- **Social:** Social criteria address a company's relationships with employees, suppliers, customers, and local communities. These include working conditions, human rights, equal opportunity, community engagement, and customer satisfaction. Organizations that emphasize social responsibility tend to foster stronger corporate cultures and earn greater stakeholder trust, contributing to customer loyalty and competitive advantage. The social dimension of ESG also covers diversity and inclusion, labor practices, and ethical engagement with communities. Companies applying ESG principles actively promote gender equality, human rights, and social inclusion across their operations.

- **Governance:** Corporate governance involves the company's organizational structure, transparency, anti-corruption practices, fair supplier relations, and disclosure obligations to investors. ESG governance criteria pertain to management structures, ethical conduct, transparency, and stakeholder engagement. High standards of corporate governance enhance investor confidence, reduce risks of corruption and reputational scandals, and contribute to long-term organizational stability and value creation.

The integration of ESG principles in enterprises operating in the electric power and transport sectors offers several strategic advantages:

- **Investor Appeal:** In the current investment climate, intangible factors such as corporate reputation and sustainability performance are increasingly significant. Investors are showing a growing preference for companies with strong ESG performance indicators.

- **Innovation Potential:** Focusing on ESG criteria often drives product and process innovations, opening access to new markets and business opportunities.

- **Regulatory Compliance:** Many countries are adopting more stringent regulations concerning sustainability, responsible production, and corporate accountability. Businesses must align their operations with these requirements to ensure legal compliance and avoid penalties.

The role of ESG in driving sustainable development, particularly within sectors with a direct environmental impact such as energy and transport, is increasingly evident through several trends:

- **Growing Environmental Awareness:** As global awareness of environmental and climate-related issues rises, companies are evaluated based on their environmental performance. This includes resource use, emissions reduction, and energy efficiency. Organizations that adopt a proactive approach to environmental management frequently gain a competitive edge and are perceived more favorably by both consumers and investors.

- **Demographic and Social Shifts:** New generations of consumers and employees—particularly Millennials and Generation Z—are more attuned to ethical business practices and corporate social impact. Companies that actively engage in social responsibility are better positioned to attract and retain talent and to build consumer loyalty.

- **Tightening Regulations:** Governments around the world are introducing

increasingly strict environmental, social, and governance regulations. Companies capable of anticipating and adapting to these shifts are more likely to avoid financial penalties and maintain operational continuity.

- **Investor and Market Pressure:** ESG factors are becoming central to the investment decision-making process. Financial institutions and investors now evaluate ESG performance as a proxy for long-term risk and sustainability. Firms with strong ESG credentials are considered less risky and more resilient, thereby attracting capital on more favorable terms.

The principles of ESG are not solely aimed at environmental protection or improving labor conditions—they form the foundation of a long-term strategic framework that enhances business growth. Enterprises adopting sustainable practices are better equipped to navigate dynamic market conditions and to attract responsible external stakeholders, including investors. Implementing ESG principles is not only a responsibility toward future generations but also a strategic investment in the organization's long-term development.

3. Literature Review

In both academic literature and business practice, ESG criteria are defined as a set of non-financial indicators used to assess corporate performance. These indicators reflect the level of an organization's social and environmental responsibility, ethical conduct, and adherence to principles of corporate governance. ESG metrics have emerged in response to a growing demand from capital markets for tools to evaluate non-financial performance, particularly in identifying firms distinguished by effective management and strong social responsibility.

Initially, ESG assessments were primarily designed for financial market participants. However, they have rapidly gained traction across various industries, becoming a strategic management tool. As highlighted in numerous studies, ESG metrics:

- support reputation building (Murè *et al.,* 2021; Nicolas *et al.,* 2024; Suhatmi, 2024),
- mitigate regulatory pressure (Ioannou, 2017; Grewal, 2019; Aboud, 2024; Nipper, 2025),
- reduce financial risk (Liwa *et al.,* 2022; Zhan *et al.,* 2023; Peliu, 2024; Pu, 2024),
- facilitate access to capital (Cheng, Ioannou, and Serafeim, 2014).

This section presents the theoretical underpinnings of ESG, accompanied by a literature review that outlines the concept of non-financial reporting—also referred to as Corporate Social Responsibility (CSR) reporting (Ferensztajn-Galardos *et al.,* 2024). Despite the growing body of literature, a unified definition of ESG factors

and standardized evaluation measures remains lacking (Clément *et al.,* 2023).

Two predominant approaches to ESG integration in corporate activity can be identified in the literature:

1. **Socially Responsible Investing (SRI):** Focused on the use of ESG indicators in investment decision-making (Aldowaish *et al.,* 2022),
2. **Operational Management:** Treating ESG as a core element of corporate strategy driven by the principles of sustainable development (Clément *et al.,* 2023).

ESG reporting has become the subject of extensive research, encompassing various analytical perspectives. These include the quality of disclosed information (Szadziewska, 2015), challenges of standardization (Breijer *et al.,* 2022; Krištofik *et al.,* 2016), the impact of ESG initiatives on corporate reputation (Axjonow *et al.,* 2018), and financial performance outcomes (Crous *et al.,* 2022; Lament *et al.,* 2022). Most of these studies focus on publicly listed companies, while significantly fewer address firms within the transport and electric power sectors.

A particularly relevant area of investigation is the analysis of ESG reports in relation to compliance with the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS). Both the structure and the granularity of ESG reports are critical, as they influence the comparability of firms across different industries (Ferensztajn-Galardos *et al.,* 2025). Additionally, the operational context plays a crucial role in shaping environmental indicators and in shaping the overall ESG reporting approach (Krajewska *et al.,* 2025).

A systematic review of the literature reveals the ongoing evolution of ESG reporting, along with numerous methodological challenges, notably the lack of standardization (Khamisu *et al.,* 2024). Analyses of the factors influencing ESG indicators and the content of disclosures demonstrate that firms adhering to ESG guidelines tend to achieve superior performance outcomes (Sustainability, 2020).

While fulfilling ESG requirements presents considerable challenges, the integration of environmental, social, and governance dimensions is increasingly recognized as a vital area of strategic development. Despite a growing volume of publications on these issues, few are embedded within a coherent ESG framework.

In the context of the electric power and transport sectors, much of the literature remains focused on the technical aspects of energy management, often neglecting the ESG perspective (Kawałkowski *et al.,* 2018; Wojciechowski *et al.,* 2018; Alfieri *et al.,* 2019; Barbosa, 2019). Nevertheless, effective energy management is a fundamental component of the environmental pillar of ESG, as it contributes to greenhouse gas emissions reduction and natural resource conservation—goals that are central to sustainable development strategies.

Although some references to ESG exist within the broader context of the electric power sector (Li *et al.,* 2024; Mao *et al.,* 2022; Shixiu *et al.,* 2022), there is a notable lack of studies specifically addressing the integration of ESG within the electric power and transport industries.

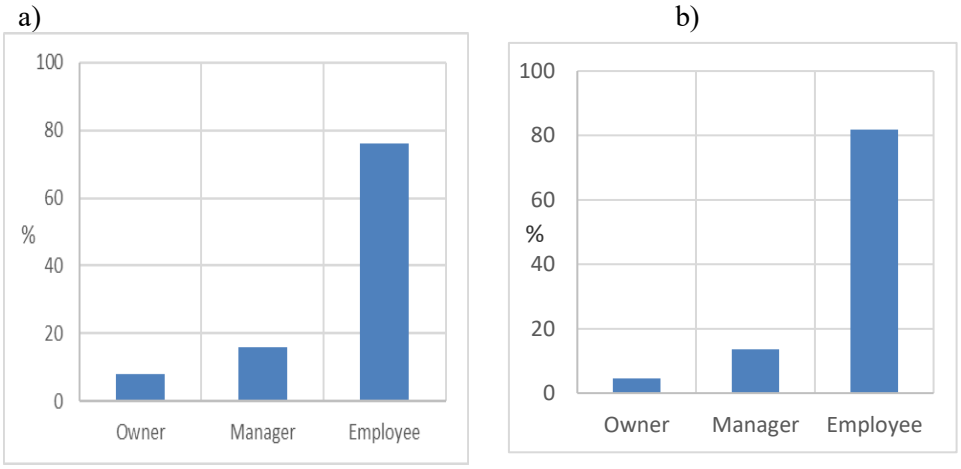
4. Methodology

Survey-based research was conducted among representatives of the two largest industrial sectors in Poland, namely the electric power generation and transport industries. The study employed a questionnaire-based approach, with survey questions primarily focused on technical aspects related to ESG implementation.

A representative sample of respondents was selected to complete the survey, categorized according to their professional roles: employee, manager, and owner.

The percentage distribution of respondents by occupational group, for both the electric power and transport sectors respectively, is presented in Figure 1.

Figure 1. *Percentage distribution of respondents by occupational role in: a) the electric power generation sector and b) the transport sector.*

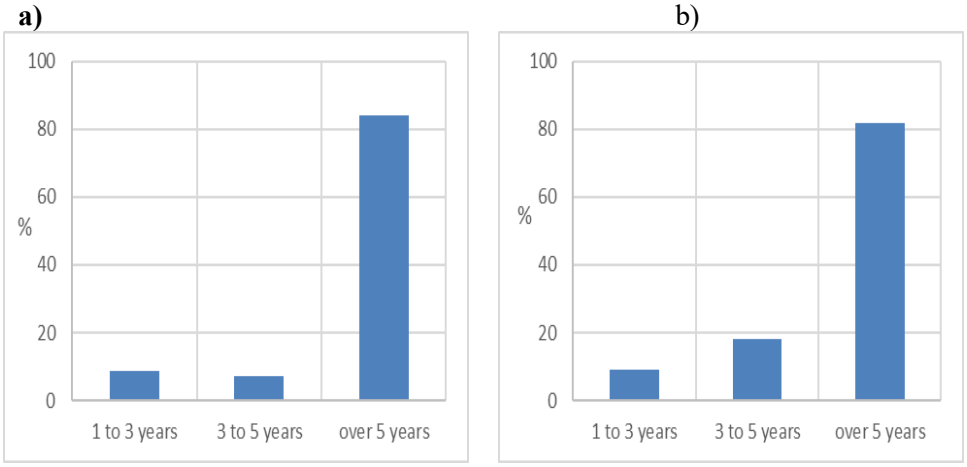


Source: *Authors' calculations.*

The surveyed employees were also selected based on their length of service within the respective companies. The following categories were used: 1–3 years, 3–5 years, and more than 5 years. It was assumed that employees with more than 5 years of service hold the most decisive voice on ESG-related matters within the organization.

The results based on this criterion are presented in Figure 2, with panel a) corresponding to the electric power generation sector and panel b) to the transport sector.

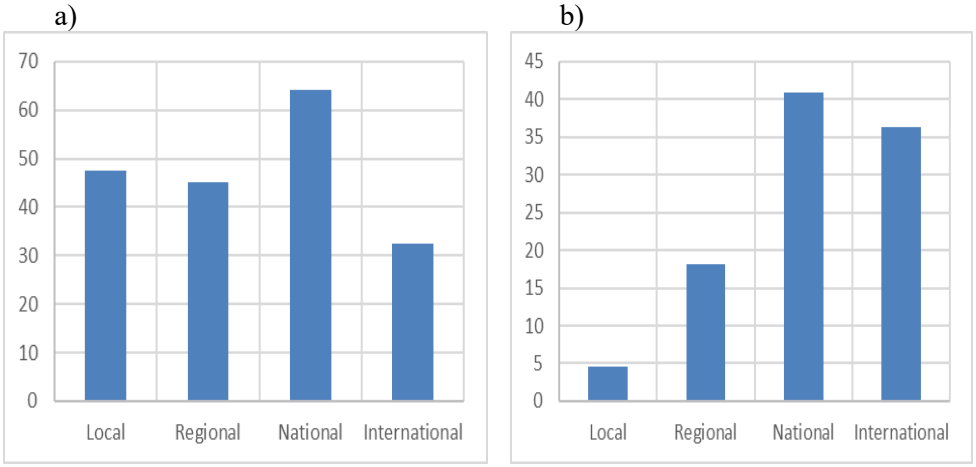
Figure 2. *Percentage distribution of respondents by length of service in the analyzed enterprises: a) electric power generation sector, b) transport sector.*



Source: *Authors' calculations.*

The distribution of enterprises according to their area of operation is presented in Figure 3.

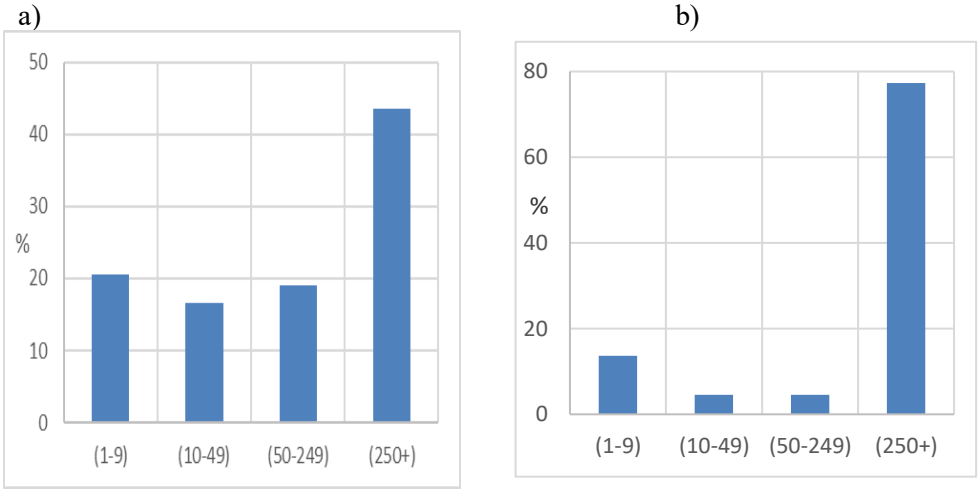
Figure 3. *Percentage distribution of enterprises represented by respondents, categorized by area of operation: a) electric power generation sector, b) transport sector.*



Source: *Authors' calculations.*

The size of the enterprise plays a crucial role in ESG reporting. Figure 4 presents the percentage distribution of the surveyed employee group according to the size of the enterprise in which they are employed.

Figure 4. *Percentage distribution of enterprises by number of employees: a) electric power generation sector, b) transport sector.*



Source: *Authors' calculations.*

5. Research Results and Discussion

The following Tables present the results of the conducted survey. The data are reported separately for the electric power generation and transport sectors. The first columns list the survey questions, while the second columns display the responses in percentage format. Each of the two tables is divided into rows, where questions and responses are grouped according to thematic areas.

a. Electric Power Generation Sector

Table 1. *Survey results indicating the level of technical ESG knowledge among respondents in the generation sector.*

Questions	**Responses**
Have you heard about ESG reporting?	Yes – 19%, No – 64.3%, Don't know – 16.7%
Is it important for companies to report their ESG performance?	Important – 55.4%, Not important – 20%, No opinion – 24.6%
Does your company prepare an ESG report?	Yes – 11.2%, No – 32.5%, Don't know – 56.3%
How would you assess the transparency of ESG information published by energy companies in Poland?	High – 5%, Moderate – 22%, Low – 9.5%, Don't know – 63.5%
Should the source of electricity be	Yes – 56%,

included in ESG reports?	No – 15%, No opinion – 29%
Should companies be required to report their carbon footprint associated with electricity consumption?	Yes – 14%, Only large companies – 30%, Should be voluntary – 38%, No opinion – 18%
Does your company's ESG report include specific data on electricity consumption (e.g., GWh/year)?	Yes – 13%, No – 18%, Don't know – 69%
What is the source of electricity used in your company?	Primarily renewable energy – 40%, Primarily fossil fuels – 30%, Mixed sources – 39%, Don't know – 21%
Is electricity consumption measured and analyzed at your workplace for ESG purposes?	Yes – 25%, No – 30%, Don't know – 45%
What impact does energy consumption have on the company's ESG performance?	Significant – 14%, Moderate – 28%, Hard to say – 17%, No impact – 4%, Don't know – 37%
Does the ESG reporting obligation influence technical decisions made in the energy department?	Yes – 10%, To some extent – 40%, Rather not – 12%, No – 5%, No opinion – 33%
Should electricians be involved in the ESG reporting process?	Yes – 16%, Rather yes – 36%, Rather not – 16%, No – 17%, No opinion – 15%
What actions are being undertaken in your company to reduce electricity losses in the grid?	Maintaining infrastructure in good condition – 32.5% Automation and consumption monitoring – 29% Replacing transformers with energy-efficient models – 10.5% Employee training – 8.5% No actions taken – 6.5% Don't know – 13%

Source: *Authors' calculations.*

The results of the conducted survey indicate that ESG awareness among respondents from the electric power generation sector remains relatively low. Only 19% of participants reported being familiar with ESG reporting, while as many as 64.3% stated they had not encountered it at all. At the same time, over half of the respondents (55.4%) considered ESG reporting by companies to be important. This suggests that, despite limited conceptual familiarity with ESG, there exists an

intuitive recognition of its value and relevance—representing potential for reputation building through education and transparency.

However, the actual practice of ESG reporting appears to be even less prevalent. Only 11.2% of respondents indicated that their company prepares an ESG report. Moreover, more than half (56.3%) were unable to answer whether such a report is produced at their workplace. This highlights a lack of internal communication and low visibility of ESG-related activities within organizations, which poses a challenge for using transparency as a foundation for reputation enhancement.

Responses regarding the transparency of ESG information published by energy companies in Poland are equally discouraging. Only 5% of respondents perceived such information as transparent, while as many as 63.5% were unable to evaluate it.

This result suggests that ESG reports may be difficult to access, overly complex, or simply not communicated effectively—either to employees or external stakeholders. Such a gap represents a significant barrier to leveraging ESG as a tool for strategic communication and trust-building.

An interesting dimension of the survey relates to opinions on the role of electricity in ESG reporting. A notable 56% of respondents agreed that the source of electricity should be included in ESG disclosures, and 44% (combined responses for "yes" and "only for large companies") believed companies should be obligated to report the carbon footprint associated with electricity use.

Despite this, only 13% confirmed that their company's ESG report contains specific data on energy consumption, while a striking 69% did not know whether such data are included. This discrepancy points to a significant gap between expectations and practice: although energy consumption—one of the most tangible aspects of ESG—is seen as important, it has yet to become a standard element of reporting.

Interestingly, 40% of respondents indicated that the electricity used in their company comes primarily from renewable energy sources, with another 39% citing mixed sources. However, over 20% of participants did not know the source of their workplace's electricity.

Similarly, 45% were unaware whether their company conducts measurements or analysis of electricity consumption for ESG purposes. This lack of awareness weakens ESG's potential as a reputational communication tool—if employees are unaware of their company's actions, such actions are unlikely to be positively perceived externally.

When asked about the impact of energy-related actions on a company's ESG performance, only 14% identified a significant impact, and 28% a moderate one. Meanwhile, 37% had no opinion, and 17% responded with "hard to say." Similarly,

although 50% of respondents acknowledged that ESG obligations influence technical decisions in the energy department, one-third had no opinion on the matter. These results underscore a strong need for education and integration of technical teams into the ESG process.

The majority of respondents (52%) supported involving electricians in the preparation of ESG reports, recognizing the importance of combining operational knowledge with data reporting. Such integration could significantly improve the quality, completeness, and credibility of ESG reports—thereby strengthening the company's reputation.

In terms of practices aimed at reducing energy consumption and losses, companies most frequently cited technical measures such as infrastructure maintenance (32.5%), automation and monitoring (29%), and equipment modernization (26.5%). However, a concerning finding is the relatively low level of educational initiatives—only 8.5% of responses mentioned employee training, and 23.5% referred to energy-related education. Additionally, 6–7% of companies reportedly take no action in this area, and a portion of respondents are unaware of any such efforts within their organization.

b. Transport Sector

Table 2. *Survey results indicating the level of technical ESG knowledge among respondents in the transport sector.*

Questions	**Responses**
Does your company implement ESG reporting?	Yes – 18%, No – 23%, Don't know – 60%
Have you participated in any training or informational activities related to ESG in your company?	Yes, once or several times – 27%, No, but I would like to – 41%, No, and I would not like to – 32%
Are there internal standards or guidelines related to ESG in your workplace?	Formal procedures – 18%, Informal guidelines – 18%, No – 23%, Don't know – 41%
How would you assess the management's engagement in ESG objectives within your company?	High – 10%, Medium – 23%, Low – 13.5%, None – 13.5%, No opinion – 41%
How would you assess your company's level of engagement with environmental and ESG-related issues?	High – 18%, Medium – 32%, Low – 13.5%, Very low – 4.5%, Hard to say – 32%
How important is the inclusion of environmental aspects (e.g., energy	Very important – 13.5%, Moderately important – 45.5%,

consumption, emissions) in ESG reports of transport companies to you?	Slightly important – 23%, Not important – 4.5%, Hard to say – 13.5%
Can rail transport become a leader in sustainable mobility in Poland?	Definitely yes – 32%, Rather yes – 63.5%, Rather not – 4.5%
Are you aware of which environmental indicators (e.g., CO_2 emissions, energy intensity) are measured or reported by your company?	Yes – 18%, Partially – 23%, No – 18%, I have no access to such information – 41%
In your opinion, are passengers and the general public sufficiently informed about ESG activities of transport companies?	Yes – 27.5%, Rather yes – 13.5%, Rather not – 27.5%, No – 13.5%, No opinion – 18%
Is electricity consumption (e.g., rolling stock, traction devices, station systems) monitored in your company?	Yes – 14%, Yes, but only periodically – 27%, No – 32%, Don't know – 27%
Should energy consumption data in transport be included in ESG reports?	Yes – 18%, Yes, but only in general terms – 41%, No opinion – 41%
Should ESG topics be included in training for transport sector employees?	Yes – 13.5%, Yes, to a limited extent – 50%, Rather not – 36.5%
To what extent should the railway transport sector integrate ESG principles into its operations?	To a large extent – 23%, To a moderate extent – 32%, To a small extent – 13.5%, Hard to say – 31.5%
Do you believe ESG reporting can improve the image of a transport company in the eyes of passengers and business partners?	Yes – 27.5%, Rather yes – 13.5%, Rather not – 27.5%, No – 13.5%, No opinion – 18%
Which ESG area do you consider the most important in the context of transport?	Environmental (e.g., emissions, noise, waste) – 23% Social (e.g., safety, accessibility, working conditions) – 23% Governance (e.g., ethics, transparency, management) – 4% All equally important – 23%, Hard to say – 27%.

Source: *Authors' calculations.*

The results of the ESG survey in the transport sector present a complex picture. On the one hand, there is a recognized need to integrate ESG principles into operational activities; on the other, limited awareness, weak managerial engagement, and restricted access to information significantly reduce the effectiveness of ESG as a

tool for building corporate reputation in the transport industry.

When asked whether ESG reporting is implemented in their company, only 18% of respondents answered affirmatively, while 60% admitted they did not know whether such reporting takes place. Similarly, just 18% confirmed the existence of formal ESG procedures, and another 18% pointed to informal guidelines—yet as many as 41% lacked any knowledge on the matter. This lack of internal transparency and communication suggests that ESG practices are not yet fully embedded in the management structures of transport companies.

The perceived level of managerial engagement in ESG is also low—only 10% of respondents rated it as high, while 41% expressed no opinion. Regarding overall company engagement in environmental and ESG-related issues, 18% assessed it as high and 32% as moderate; however, nearly one-third (32%) were unable to evaluate this aspect. These figures highlight the urgent need for improved communication and greater visibility of ESG activities throughout organizations.

A majority of respondents recognized the importance of including environmental aspects—such as energy consumption and emissions—in ESG reports for transport companies, with 59% indicating moderate or high significance. Notably, 95.5% of respondents agreed that rail transport has the potential to become a leader in sustainable mobility in Poland, suggesting that sustainable transport represents not only a necessity but also a reputational opportunity for the sector.

Nonetheless, awareness of which environmental indicators are actually being measured and reported by transport companies remains low. Only 18% of respondents confirmed such awareness, while 41% stated they have no access to this information. Furthermore, just 27.5% believe that passengers and the public are sufficiently informed about transport companies' ESG activities, and an additional 41% had no opinion—indicating a clear gap in external communication and transparency.

Energy consumption monitoring—a key environmental component—is also not yet standard practice. Only 14% of respondents reported regular monitoring in their companies, while 27% mentioned periodic monitoring. Significantly, 59% agreed that energy consumption data should be included in ESG reports. This points to an opportunity to enhance corporate reputation by delivering credible, data-based disclosures and improving transparency.

With respect to ESG education, only 13.5% of respondents reported that ESG topics are included in employee training. Another 50% noted that such training is implemented to a limited extent, while 36.5% stated that ESG is not addressed at all. Given the growing importance of environmental considerations in transport, this lack of employee education poses a serious barrier to the effective implementation of ESG practices.

Despite these limitations, a combined 59% of respondents (including "yes" and "rather yes") believe that ESG reporting can enhance the image of a transport company in the eyes of passengers and business partners. This strongly suggests that ESG—if approached seriously, underpinned by robust data, and communicated effectively—can serve as a genuine tool for reputation building and competitive advantage.

When asked which ESG dimension is the most important in the context of transport, responses were relatively evenly distributed: 23% identified the environmental aspect, another 23% the social aspect, and yet another 23% viewed all three ESG pillars as equally important. Only 4% prioritized corporate governance, while as many as 27% could not make a clear determination. This indicates not only a need for further education but also reflects the multifaceted nature of ESG in the transport sector, where issues such as emissions, noise, passenger safety, and working conditions are all of critical importance.

6. Conclusions

The analysis of survey results on ESG reporting within the electric power and transport sectors reveals a low level of awareness and engagement in the area of sustainable development. In both sectors, a significant proportion of employees lack knowledge about whether their companies prepare ESG reports, indicating limited internal communication and the absence of an organizational culture focused on ESG. Respondents frequently reported a lack of access to information, or described ESG-related initiatives as informal and sporadic.

Managerial engagement in the implementation of ESG objectives is also perceived as low or moderate, which is reflected in the absence of systematic actions such as energy consumption monitoring, CO_2 emissions analysis, or the implementation of specific environmental indicators.

At the same time, there is an emerging awareness that environmental responsibility and transparency can have a tangible impact on corporate reputation—particularly in social and business contexts. Respondents recognize the potential of ESG as a tool for building a positive organizational image, although it is not yet being fully leveraged.

Notably, both sectors exhibit a strong interest in training and capacity building in ESG. A substantial share of respondents admitted they had not yet participated in any ESG-related educational activities but expressed a desire to do so. This reveals an opportunity for targeted development initiatives aimed at enhancing competencies and increasing employee engagement in ESG practices.

To address the identified gaps and limitations, several key actions are recommended:

1. **Mandatory ESG Training.** Companies should invest in structured ESG training programs for both managerial staff and technical personnel. These programs should go beyond theoretical overviews and include practical components, such as measuring energy consumption, calculating carbon footprints, and implementing emission reduction and energy efficiency strategies.

2. **Standardization of ESG Data Collection and Reporting.** There is an urgent need to standardize processes for collecting, analyzing, and reporting ESG data. This applies to energy use in both energy and transport enterprises, including data on railway rolling stock, traction systems, and station infrastructure. Without reliable data, effective sustainable management is not possible.

3. **Integration of Technical Departments in ESG Reporting.** Technical departments—such as energy and transport engineering teams—should play an active role in the ESG reporting process. These professionals possess operational knowledge and access to key data that form the basis of credible and comprehensive reports. ESG should not be seen as the sole responsibility of PR or compliance departments but as an integral component of operational management.

4. **Leadership and Strategic Commitment.** It is recommended that company leadership adopt a proactive role in ESG implementation by demonstrating personal commitment, promoting best practices, and embedding sustainability goals into corporate strategy. ESG should be part of long-term planning, innovation, and competitive strategy, rather than merely a regulatory requirement.

5. **Improved Transparency Toward Internal and External Stakeholders.** Companies should enhance the transparency of their ESG activities, both internally (toward employees) and externally—toward passengers, energy consumers, business partners, and public institutions. There is a growing societal expectation for information about companies' environmental impact. Transparency can foster trust and strengthen corporate reputation.

While the current level of ESG implementation in the electric power and transport sectors is limited, there is clear potential for progress. The key drivers of improvement include education, technical engagement, standardized reporting, and strong strategic leadership.

Implementing these measures will not only enhance ESG reporting processes but will also contribute to tangible advancements in sustainable business practices.

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