

Green bonds issued by Polish companies listed on the Warsaw Stock Exchange Catalyst*

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Abstract

The aim of this article is to characterise the market for green bonds (GBs) issued by Polish companies and to highlight the key features of this segment in comparison with traditional debt financing. The analysis is exploratory in nature and is based on publicly available information about issuers for whom the use of green bonds and corporate bonds linked to sustainable development (SLBs). The data collected indicate that the market in Poland is no longer purely sporadic and encompasses entities from sectors such as energy, banking, property, telecommunications, retail and logistics. At the same time, its structure remains centred on a few major issuers and several large transactions, including Polenergia's issue worth PLN 750 million and Mosty Magazynów Energii's issue worth PLN 100 million. To organise the findings, a simple descriptive analysis was carried out using a benchmark consisting of the average yields on ordinary corporate bonds listed on Catalyst. The yields on green bonds were also compared with those on KGHM S.A. bonds, which were treated as representative of the most creditworthy corporate debt issuer. The results indicate that, relative to the average spread for ordinary corporate bonds, they are nevertheless cheaper by approximately 0.72% (lower cost of debt), which points to a moderate price premium (greenium). Compared with KGHM S.A., the issuer with the highest creditworthiness, green bonds exhibit a higher spread, which mainly reflects the difference in credit risk. The study also found that there is a positive correlation between the size of the issue and a lower cost of debt.

Keywords: ESG, green bonds, Warsaw Stock Exchange, Catalyst, sustainable finance, corporate finance, corporate bonds, renewable energy

Introduction

In recent years, green bonds have become one of the most important instruments for financing investments related to the energy transition and, more broadly, sustainable development. Their growing importance is reflected not only in developed capital markets, but also in countries where the green finance sector is only just reaching a larger organisational and investment scale. In Poland, this process is particularly interesting, as successive issues confirm that green debt instruments are becoming a viable source of corporate finance, rather than merely a tool for enhancing corporate image (Polenergia, 2024).

A significant institutional step towards increasing access to this market in Poland was the launch by the Warsaw Stock Exchange of the "Warsaw Sustainable Segment" (GPW Catalyst 2026). It organises information on financial instruments funding activities related to sustainable development and, above all, enables the trading of green bonds and bonds linked to sustainable development. This means that the domestic market has reached a level of institutionalisation that justifies undertaking initial research to organise the structure of issuers and the basic parameters of issues. The aim of this article is to conduct a preliminary identification of Polish issuers of green bonds

and sustainability-linked corporate bonds, followed by a description of the key characteristics of this segment in comparison with traditional debt financing. The average yield spread of standard corporate bonds listed on the Catalyst market (WSE 2026) without an environmental component was adopted as the benchmark. A comparison was also made with standard KGHM bonds, treating them as an example of securities with the best market reputation and, consequently, the lowest yield spread. The article poses three research questions: which Polish companies use green debt instruments, which sectors dominate among issuers, and what key characteristics of these issues can be identified in comparison with traditional bond financing.

Theoretical and market background

Green bonds are debt instruments defined by the Green Bond Principles (ICMA GBP), the proceeds of which are allocated to financing or refinancing projects with a positive environmental impact (GPW, 2023; mBank, 2024). Sustainability-linked bonds (ICMA SLB) are of a different nature, in that their financing terms depend on the achievement of specific sustainability indicators, rather than merely on the allocation of funds to a specific portfolio of projects. This distinction is significant from both a methodological and a business perspective, as both types of instruments are traded on the same market but correspond to different models of funding management and ESG quality signalling.

In the international literature, the fundamentals of green bond issuance are analysed within two main strands. The first focuses on firm-level determinants (Al Hamrani and Al Hamrani, 2025); in a systematic review of the literature covering the years 2007–2023, they indicated that the most frequently studied factors determining the issuance of green bonds are firm size, financial leverage, profitability and liquidity. Similarly (Petreski, 2025), citing (Cantillo and Wright 2000), identifies high and stable profitability, available collateral and company size as key factors in choosing this source of financing, whilst citing (Denis and Mihov 2003) identifies high profits as a determinant of bond issuance. In contrast, (Chiesa and Barua 2019) suggest that high equity or low flexibility in taking on additional debt may limit this propensity. In turn, research on the bank–firm relationship (BIS, 2024) reveals that the motives for issuing bonds vary depending on the issuer’s profile. For ‘green’ firms, liquidity and financial leverage are of decisive importance, whilst for ‘brown’ firms, it is firm size and the cost of finance. Furthermore, in a study based on a sample of international corporate issuers of green bonds (Flammer, 2021), it was shown that such issues are associated with an improvement in the issuer’s environmental indicators and a positive reaction from the equity market on the day the issue is announced, which supports the hypothesis regarding the signalling function of this instrument. Similar conclusions regarding the positive reaction of share prices to the announcement of green bond issues, particularly in the case of issuers with high environmental credibility, are drawn by (Tang and Zhang, 2020). At the level of institutional determinants (Fatica, Panzica and Ranca 2021), they indicate that the propensity to issue green bonds is significantly higher amongst public sector issuers and financial institutions than amongst non-financial firms, suggesting that the motives for issuance vary depending on the nature of the entity.

The second strand concerns the scale and dynamics of the global market. According to data from the Bank for International Settlements (BIS, 2025), the annual value of green bond issuance reached USD 700 billion in 2024, which still represents a fraction of the estimated annual investment requirement for combating climate change (approximately USD 2 trillion). A report by the IFC and Amundi (2024) notes that issuance in emerging markets rose by 34 per cent year-on-year, reaching US\$135 billion in 2023, whilst the total value of global green, social and sustainable bond issuance exceeded US\$1 trillion. The OECD (2024) also points to dynamic growth in corporate social and sustainable bond issuance (by 30% and 28% respectively between 2023 and 2024), which suggests a growing diversification of sustainability-linked debt instruments, extending beyond traditional green bonds. Data from the Climate Bonds Initiative (2024) confirm this trend, highlighting a steady increase in the share of issuers from Asia – particularly China – in the global volume of issuance, whilst Europe continues to dominate as the largest regional market.

A third line of research focuses on the pricing of green bonds and the so-called ‘greenium’ – that is, the difference in yield between a green bond and its conventional counterpart with similar parameters. A pioneering study (Zerbib, 2019) using a sample of paired issues demonstrated the existence of a small but statistically significant negative price premium for green bonds, implying a lower cost of funding for the issuer. Similarly, (Baker et al., 2018), in a study of the US municipal and corporate bond markets, found that green bonds trade at a price premium relative to conventional bonds, particularly in the case of issues certified by independent third parties. However, these findings

are not consistent across the literature – a systematic review (MacAskill et al., 2021), covering the results of empirical studies from 2007 to 2020, points to significant variation in estimates of the premium's magnitude depending on the methodology used, the market and the study period, suggesting that the 'greenium' phenomenon is not universal and is strongly dependent on the institutional context and the maturity of the green bond market in a given country.

In the Polish context, the market for green debt instruments is developing in a sector-specific manner, but remains concentrated (Parkiet, 2025). Public sources list issuers from the renewable energy sector, the conventional energy sector undergoing transition, banking, property, telecommunications, retail and logistics. At the same time, the scale of issuance remains largely dependent on a few large transactions and the activity of entities with relatively high organisational capacity and market recognition. It is particularly worth noting that the Polish market includes both industrial and energy entities, as well as financial institutions utilising green issues on the domestic market and the [BANK.pl](#) Euromarket, (2024). This opens up the possibility of not only sectoral but also comparative analyses, taking into account the differing logic of capital raising by non-financial issuers and banks on [the BANK.pl platform](#), (2024). From the perspective of a short research article, a cataloguing and comparative approach, together with a preliminary market analysis, is therefore particularly useful.

Aim, research questions and hypothesis

The main objective of this article is to organise information on Polish green bond issuers and to present the key characteristics of their issues (Parkiet, 2025; GPW, 2023). Specific objectives include identifying the dominant sectors in the sample, highlighting the largest transactions, and comparing green bond issues with a benchmark consisting of the average spread on conventional bonds and KGHM S.A. as the highest-rated investor. The following research questions have been formulated. Firstly, which Polish companies utilise green bonds or related sustainable financing instruments. Secondly, which sectors dominate among issuers and whether the market shows signs of diversification. Thirdly, what key characteristics of the issues can be identified in comparison with traditional bond financing, as represented by the KGHM S.A. benchmark.

The working hypothesis assumes that the Polish green bond market is already sufficiently developed to constitute a recognisable segment of the capital market, but remains concentrated around a few major issuers and a few dominant sectors.

Data and Methodology

This study is exploratory in nature and is based on publicly available sources of information confirming the use of green bonds or other related sustainable finance instruments by Polish entities. The sample included only those cases where it was possible to verify, via primary sources, the fact of an issue or the issuer's presence in the sustainable finance segment, and where the bonds are listed on the Warsaw Stock Exchange (). This selection of the sample reduces the risk of misclassification, although it does not eliminate the problem of data incompleteness for some of the observations.

The analysis employed descriptive and statistical methods. For each issuer, the sector of activity, type of instrument, value of financing, date of issue or allocation, currency and a brief research note were compiled. A qualitative comparison was then carried out against a benchmark consisting of ordinary KGHM S.A. bonds. Even large Polish issuers whose bonds are listed on a market other than Catalyst were excluded from the research sample. The collected data are presented in Table 1.

Table 1. Summary of key information on GBP and SLB bonds listed on Catalyst.

No.	Issuer	Sector	Type of instrument	Issue amount in thousands of PLN	Date of issue and/or allocation	Currency
1	New Energy Investments S.A.	Renewable energy	Green Bond (ICMA GBP)	75,000	1 December 2020	PLN
2	Famur S.A.	Heavy industry	Green Bond (ICMA GBP)	400,000	3 November 2021	PLN
3	Ghelamco Invest Sp. z o.o.	Commercial property	Green Bond (ICMA GBP)	240,000	3 February 2023	PLN
4	Polenergia S.A.	Renewable Energy	Green Bond (ICMA GBP)	750,000	16 October 2024	PLN
5	R.Power S.A.	Renewable Energy	Green Bond (ICMA GBP)	530,000	30 October 2024	PLN
6	7R S.A.	Commercial property	Green Bond (ICMA GBP)	150,000	4 February 2025	PLN
7	P4 Sp. z o.o.	Telecommunications and media	Green Bond (ICMA GBP)	700,000	27 February 2025	PLN
8	Mosty Magazyny Energii Sp. z o.o.	Renewable Energy	Green Bond (ICMA GBP)	100,000	5 November 2025	PLN
9	Pepco Group S.A.	Retail	Green Bond (ICMA GBP)	600,000	6 November 2025	PLN
10	Tauron Polska Energia S.A.	Conventional energy	Sustainability-Linked Bond (ICMA SLB)	1,000,000	30 October 2020	PLN
11	Polsat Plus Group S.A.	Telecommunications and media	Sustainability-Linked Bond (ICMA SLB)	2,670,000	11 January 2023	PLN
12	Anwim S.A.	Fuel trading	Sustainability-Linked Bond (ICMA SLB)	65,000	16 November 2023	PLN
13	Żabka Group S.A.	Retail	Sustainability-Linked Bond (ICMA SLB)	1,000,000	7 May 2025	PLN

Source: Own analysis based on data from the Warsaw Stock Exchange

Results

The summary of key information in Table 1 indicates that the Polish green bond market has already reached a level where it can be identified as a distinct segment of the capital market. The presence of this segment is evidenced both by the activity of large issuers and by the development of the Warsaw Stock Exchange's information infrastructure for sustainable instruments. At the same time, the analysis shows that the market is not yet fully broad-based and diversified, as its volume relies mainly on a few of the largest transactions. The greatest market-making influence currently comes from issues carried out by entities with strong organisational capacity and high brand recognition, such as Polsat Plus Group S.A., Tauron Polska Energia S.A. and Żabka Group S.A. The overview presented in the table addresses the first objective of the study, namely identifying the companies that issue green bonds and their key characteristics. The study points to growing sectoral diversification in the market. The presence of companies from the renewable energy, banking, telecommunications, property, retail and logistics sectors suggests that green financing is no longer limited to a single business model. This structure may provide a basis for further research into whether green bonds fulfil not only a capital function on the Polish market, but also a reputational and strategic one.

To address the second point of the study, the bond issues were categorised by sector of business activity. This information is summarised in Table 2.

Table 2. Breakdown of GB and SLB bond issuers by sector

Sector	Number of issuers	Total value of the sector's issues in PLN	Market share
Conventional energy	1	1,000,000	12.1%
Renewable energy	4	1,455,000	17.6%
Heavy industry	1	400,000	4.8%
Telecommunications and media	2	3,370,000	40.7%
Commercial property	2	390,000	4.7%
Fuel trade	1	65,000	0.8%
Retail trade	2	1,600,000	19.3%
TOTAL	13	8,280,000	100.0%

Source: Own analysis based on data from the Warsaw Stock Exchange

Table 2 presents the structure of issuers by sector, showing both the number of entities in a given sector and the total value of issues, as well as their share of the overall market. The breakdown indicates a clear concentration of the market in several sectors, with the highest share of the value of issues accounted for by telecommunications and media, which make up 40.7% of the market, despite comprising only two issuers. The second significant group is the retail sector, with a 19.3% share, followed by the renewable energy sector with a 17.6% share, suggesting the growing importance of sectors linked to consumption and the energy transition. It is worth noting that the number of issuers does not directly translate into the value of issues, as sectors with a larger number of entities, such as renewable energy, generate a lower market share than telecommunications and media. The smallest market shares are observed in the fuel trade (0.8 per cent) and commercial property (4.7 per cent), which may indicate the limited scale of debt financing in these segments. Overall, the market structure suggests the dominance of a few sectors with relatively large individual issues, whilst the remaining sectors are fragmented.

To address the third objective of the study, the focus was on assessing and comparing the interest margin between green bonds (GB instruments) and traditional corporate bonds. Table 3 presents a summary of costs in the form of margins.

Table 3. Summary of green bond (GB) spreads

No.	Issuer	Issue amount	Base rate	Spread in %
1	New Energy Investments S.A.	75,000	3-month WIBOR	2.80
2	Famur S.A.	400,000	3-month WIBOR	2.90
3	Ghelamco Invest Sp. z o.o.	240,000	WIBOR 6M	5.00
4	Polenergia S.A.	750,000	WIBOR 6M	2.70
5	R.Power S.A.	530,000	WIBOR 6M	3.50
6	7R S.A.	150,000	WIBOR 6M	4.80
7	P4 Sp. z o.o.	700,000	WIBOR 6M	1.80
8	Mosty Magazyny Energii Sp. z o.o.	100,000	WIBOR 3M	3.50
9	Pepco Group S.A.	600,000	WIBOR 6M	2.50
	Average value			3.28
	Median			2.90

Source: Own analysis based on data from the Warsaw Stock Exchange

The table shows that the WIBOR reference rates for the entities analysed differ between 3M and 6M. However, this factor was deliberately omitted because an additional breakdown would have resulted in a very small sample size.

Above all, however, the omission of this distinction is justified by the fact that the difference between the 3M and 6M rates as at the end of the study period was 0.08 per cent and could not have materially affected the final result of the study. The analysis carried out indicates that the average margin on green bonds (GB type) is 3.28 per cent, whilst the median for them is 2.90 per cent. When comparing the average margin (the premium over the reference rate) to the market average for ordinary corporate bonds, estimated at around 4 per cent (Stępień 2026), green bonds exhibit a margin that is approximately 0.72 per cent lower. However, when compared to the issuer with the highest credit rating, KGHM S.A., for which the margin is 1 per cent (KGHM 2025), green bonds show a margin that is 2.28 per cent higher. This is due to KGHM S.A.'s very high credit rating.

Table 4. Summary of margins on sustainability-linked bonds (SLB type)

No.	Issuer	Issue amount	Base rate	Spread (%)
1	Tauron Polska Energia S.A.	1,000,000	WIBOR 6M	1.35
2	Polsat Plus Group S.A.	2,670,000	WIBOR 6M	3.35
3	Anwim S.A.	65,000	WIBOR 3M	4.40
4	Żabka Group S.A.	1,000,000	WIBOR 6M	1.50
	Average value			2.65
	Median			2.43

Source: Own analysis based on data from the Warsaw Stock Exchange

The analysis carried out indicates that the average yield spread on sustainability-linked bonds (SLB type) is 2.65 per cent, whilst the median stands at 2.43 per cent. When comparing the average spread (the premium over the benchmark rate) to the market average for ordinary corporate bonds, green bonds show a spread that is approximately 1.4% lower. By contrast, when compared to the issuer with the highest credit rating, KGHM S.A., green bonds show a margin that is 1.65% higher. Thus, the mean and median values for GB bonds are higher than for SLB bonds. It should be noted, however, that the final cost and margin of SLB bonds are not known at the time of issue, as they may be higher if KPIs are not met.

In the final part of the study, Spearman's correlation was used to analyse the relationship between the size of the bond issue and the cost of the capital raised as a result (represented by the spreads on GB and SLB green bonds). Spearman's rank correlation analysis for all 13 issuers revealed a statistically significant negative relationship between the issue amount and the bond margin. The resulting Spearman's correlation coefficient, $r = -0.642$, at a significance level of $p = 0.018$, indicates that larger issues were generally accompanied by lower spreads, suggesting the presence of economies of scale in the context of debt financing. From a methodological perspective, this result confirms the existence of a monotonic relationship between the variables under study, significant at the 5% level. The correlation analysis was also carried out separately for groups of issuers of GP and SLB bonds. For GP green bonds, with 9 observations, the correlation coefficient was also negative, at $r = -0.579$; the strength of the correlation is therefore moderate. For SLB-type sustainability-linked bonds, with 4 observations, the correlation coefficient was also negative, at $r = -0.250$, indicating a weak correlation.

Table 5. Summary of the results of the Spearman's rank correlation analysis

Variable 1	Variable 2	Spearman's coefficient (r)	Significance level (p)	Interpretation
Amount of issue	Margin in %	-0.642	0.018	A negative, moderately strong and statistically significant relationship; as the issue amount increased, the margin decreased.

Source: Author's own analysis based on data from the Warsaw Stock Exchange

The analysis carried out identified 13 bond issues, including 9 green bond issues and 4 sustainability-linked bond issues, carried out by Polish companies listed on the Catalyst market of the Warsaw Stock Exchange between October 2020 to November 2025, with a total value of 8,280,000,000 PLN (Table 1). The sectoral structure of the market

indicates a concentration in terms of value, whilst the number of issuers is dispersed. The telecommunications and media sector, represented by two issuers (Polsat Plus Group S.A. and P4 sp. z o.o.), accounted for 40.7% of the total value of issues, despite comprising only 15.4% of the number of issuers in the sample. Renewable energy, although one might assume it would be the sector most interested in this type of financing and the most numerous in terms of issuers (4 issuers), generated 17.6% of the market value — less than the retail sector (19.3%, 2 issuers). The lowest share by value was recorded in the fuel trade (0.8%) and commercial property (4.7%) (Table 2).

Limitations of the study

This study is preliminary in nature and is based on publicly available sources, which do not always contain a full set of issue parameters. For the issuers presented in the study, basic issue details, currencies and dates have been established. The information on the margin shows the margin for the first tranche of a given issue. It should be emphasised that, particularly for Sustainability-Linked Bonds (ICMA SLB), the margin may increase in subsequent periods due to failure to meet the requirements set out in the bond terms and conditions. This means that the table presented is provisional and should not be treated as a definitive register of all issues. The Spearman's rank correlation coefficient obtained ($r = -0.642$, $p = 0.018$) is interesting but requires some qualification regarding the strength of the conclusion given such a small sample size. This is because a single outlier (e.g. Ghelamco with a margin of 5.00% and a relatively low issue amount of PLN 240 million) can significantly alter the result. A simplification was also adopted in the study by treating the 3M and 6M WIBOR rates as equivalent, mainly due to an insignificant difference of 0.08%.

Conclusions

The study conducted provides answers to the three research questions posed. Firstly, the Polish market for green corporate bonds and sustainability-linked bonds listed on Catalyst currently comprises 13 identified issuers (9 GBs and 4 SLBs) from seven different economic sectors, which indicates that the market has transitioned from an incidental phase to an early phase of institutionalisation. Secondly, the market's sectoral structure is diversified in terms of the number of participants but highly concentrated in terms of value: two issuers from the telecommunications and media sectors account for over 40 per cent of the total issue value, which confirms the research hypothesis regarding market concentration around a small number of large transactions. Thirdly, with regard to the cost of financing (represented by the margin above WIBOR), and taking into account the small sample size, the results obtained confirm the hypothesis regarding the existence of a price premium (the so-called 'greenium') for green bonds at a level of approximately 1 per cent relative to the average margin on the Catalyst market for ordinary corporate bonds. This finding is consistent with some of the international literature pointing to the existence of the 'greenium' (BIS, 2025). The working hypothesis—that the Polish green bond market is already sufficiently developed to constitute a recognisable segment of the capital market, but remains concentrated around a few major issuers and sectors—has been confirmed. Furthermore, Spearman's rank correlation analysis indicates the existence of an economy of scale in debt financing linked to environmental objectives: larger issues are associated with a lower cost of capital, which is consistent with findings in the global literature on the determinants of green bond issuance, which identify company size as a significant factor in financing costs (Al Hamrani and Al Hamrani, 2024). The study's findings have practical implications for issuers considering entering the green bond market, as they indicate that there is a cost advantage associated with the 'green' nature of the instrument, in the form of a lower spread over the benchmark rate in bondholders' expectations. From a research perspective, this study serves as a starting point for further analysis, which, with a larger sample size and a longer time horizon, could employ more rigorous econometric methods to isolate the actual effect of the 'green' nature of the bonds from the effect of the issuer's credit risk. The main limitation of the study stems from the small sample size ($n=13$, comprising 9 GBs and 4 SLBs) and its preliminary, exploratory nature, which calls for caution when generalising the findings to the entire green finance market in Poland.

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