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Green Covered Bonds as instruments for sustainable financing of the real estate market in Poland

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Abstract

Objective: The purpose of this article is to identify factors influencing the development of green covered bonds in Poland. The domestic green covered bond market and PKO Bank Hipoteczny SA, as a pioneer of international green mortgage bond issuance, were chosen as a case study.
Material and methods: The study applies a case study approach to examine the green mortgage bond market in Poland and identify barriers to its development.
Findings: The development of the green covered bonds market will not be possible without the implementation of systemic solutions, including incentive schemes specifically designed for mortgage banks and other market participants. A significant barrier is the limited supply of environmentally friendly properties in Poland.
Research limitations: Insufficient legal and uniform terminology for green covered bonds. A clear limitation in the research is the lack of sufficient transparency and understanding of this topic in the Polish market, as well as the absence of uniform terminology and a legal definition of green covered bonds.
Research implications: There is a need to foster greater understanding of green financing mechanisms among regulators and policymakers in Poland. The development of the green covered bonds market requires a comprehensive systemic approach, including the creation of incentive schemes to promote green covered bonds (e.g., fiscal incentives). This includes support for mortgage banks as issuers of green covered bonds, investors purchasing these bonds (with the purchase of green covered bonds receiving particular encouragement), and borrowers seeking green financing for environmentally friendly and sustainable properties.

Keywords:	Green covered bonds; Mortgage banks; Green financing; Energy efficient mortgage*; S*ustainable real estate
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INTRODUCTION

Tackling climate change is essential for the future of Europe and the world. All EU Member States ratified in 2015 Paris Agreement (Paris Agreement, 2015), stating that the EU will take action to become climate neutral by 2050 (5 facts about ..., 2019). The European Green Deal is the EU's strategy for achieving this goal. One of its elements is the 'Fit for 55' package to achieve the EU's climate targets (European Green Deal, Brussels, 11.12.2019).

Buildings are the largest consumers of energy in Europe. Therefore, the building sector is crucial to achieving the EU's energy and climate targets. Buildings account for 40% of energy consumed and 36% of energy-related greenhouse gas emissions. Within the EU, heating, cooling and domestic hot water account for 80% of the energy consumed by households (*Key facts on energy....* 2023). One priority is to reduce the energy demand of existing residential and public buildings. It is therefore necessary to renovate buildings to make them more energy efficient and thus less dependent on fossil fuels (*Proposal for a Directive...*, 2021).

The real estate market and its financing system therefore, deal with any environmental challenges and play a key role in the transition to a green and more sustainable economy. The role of financial institutions, including the mortgage banking sector, is to observe and constantly follow the demand of financial market participants. At the 2017 One Planet Summit, the European Commission emphasized the financial sector's role in creating a low-carbon future. It encouraged banks to finance projects that positively impact climate change and offer mortgages for energy-efficient buildings (The Network for Greening the Financial System, 2017. NGFS brings together central banks and supervisors, committed to taking due account of the climate risk to global financial stability. Green covered bonds (GCBs) are a response to this challenge from the banking sector. GCBs are based on green mortgages (energy-efficient mortgages) and are used to finance green and energy-efficient construction, aligned with the European Green Deal (*The European Green Deal*, 2019) and the Energy Performance of Buildings Directive (EPBD, 2024).

The purpose of this article is to make a general characterization and identify factors influencing the development of green covered bonds in Poland, issued by mortgage banks. The domestic green covered bond market and PKO Bank Hipoteczny SA, as a pioneer of international green covered bond issuance, were chosen to be described in detail. The issuance was also the first of its kind in a European Union country where the European Bank for Reconstruction and Development (EBRD) has operations.

The publication also includes 3 specific objectives:

1. To describe the issues and define the concepts in the 'green' area, such as green real estate, green covered bonds (GCB), green mortgages (GM)
2. To approximate the legal conditions, including EU regulations affecting the process of real estate market transformation towards a green market
3. Indication of national legal regulations concerning the issuance of green covered bonds, as well as the current status and factors of development of these financial instruments in Poland

The article makes a new contribution to the literature on the subject and fills a knowledge gap in the field of green bonds. This subject area in Poland is not yet well recognized and described. Lastly there are a lot of publications connected with green finance, green bonds (Maltais & Nykvist, 2021; Gilchrist, Yu & Zhong, 2021; Sobik, 2023), but there is a limited publication about exactly green covered bonds (especially the publications European Covered Bonds Council, particularly specialist publications, Hypostat and EMF-ECBC statistical reports). Using the Polish green covered bonds market and PKO Bank Hipoteczny SA as a case study, this paper provides insights into the level of growth of the green covered bond market. The paper uses a literature research method, using national and EU legal regulations, reports of selected organisations of green financing banks and green covered bond issuers, and academic articles, the vast majority from the last 5 years, synthesizing the knowledge in the field.

Literature Review

On 28 May 2024, the revised Energy Performance of Buildings Directive entered into force (Directive (EU) 2024/1275). This key piece of legislation introduces a new order to the real estate market and its financing in the EU.

The European mortgage and housing finance sectors face key challenges. From an environmental standpoint, European residential dwellings must adapt to rapidly changing climate conditions and comply with new building energy performance requirements to contribute towards meeting the EU's climate goals (Hypostat, 2024).

Construction is the sector that generates the most energy consumption. It accounts for more than 1/3 of total energy consumption, making it also a key source of CO2 emissions. Sustainable construction will be key to achieving the goal of net zero emissions by 2050, which should translate into greater interest in ‘green’ certificates. Green buildings (G.B’s) should be seen as the practice of creating healthier and more resource-efficient models for construction in all its aspects (Zuo & Zhao, 2014).

According to the U.S. Environment Protection Agency (EPA, 2014), green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by efficient use of resources, protecting occupant health, improving employee productivity and reducing waste, pollution and environmental degradation. EPA uses the GreenCheck process like a reminder to all EPA architecture, engineering and real estate professionals to keep sustainability at the forefront throughout the project life cycle EPA uses green building and energy performance certifications such as ENERGY STAR® as part of its toolkit for acquiring high performance G.B’s and ensuring their continued performance (United States Environmental Protection Agency, Last updated on November 5, 2024).

Green building certification schemes are a set of tools that are used to evaluate a building's performance from an environmental and sustainability perspective. The aim is to determine whether they are designed, built and operated in a sustainable manner. The rating of buildings is based on energy efficiency, water consumption, indoor air quality, material selection and sustainable location, among others.

Various green rating systems exist around the world. There are also studies that systematically review, review the effectiveness and development of green rating systems (Doan et al., 2017).

Certified buildings are considered to use less energy, provide better living conditions, and contribute to the reputation of the property (Yu& Tu2011).

The benefits of G.B. certification are pointed out, among others, by Ciora, Maier and Anghel (2016), who, in their study carried out in the US market, indicated that commercial buildings with a LEED or Energy Star label achieved a higher increase in the sale price of these properties (Ciora, Maier, and Anghel, 2016).

Brown and Watkins (2016) conducted a systematic review and meta-analysis of existing studies of the benefits of certified homes (single-family residential properties, LEED and ENERGYSTAR certified). They proved that purchasers of residential properties derive greater satisfaction from buying a certified and environmentally friendly house, despite spending more money (Brown and Watkins, 2015).

There are nearly 600 worldwide green product certifications with nearly 100 in use in the U.S., (Vierra, 2016) The sustainable design trend was initiated in the 1990s with the creation of Building Research Establishment's Environmental Assessment Method (BREEAM) in the U.K. One decade past also U.S created their own certification - the U.S. Green Building Council (USGBC), followed by the Leadership in Energy and Environmental Design (LEED) rating system for new construction (Vierra, 2016).

Key certification schemes in real estate include *WELL Building Standard*, *BREEAM (Building Research Establishment Assessment Method),* Green Globes, Living Building Challenge and LEED (*Leadership in Energy and Environmental Design) (*CFP Green Buildings, *The 5 most important green building certifications in Europe).*

The WELL Building Standard is a method for measuring and assessing the impact of G.B's on human health. WELL places a strong emphasis on human health outcomes as central to sustainable development (CFP Green Buildings, *The 5 most important green…).* Ildiri et al. (2022) proved the effectiveness of WELL certification and their positive impact on health of the employees of the building they use. The results showed that WELL certified offices had a positive impact on occupant satisfaction with the workplace and its health and productivity, with increases in means from pre-to post-occupancy being highly statistically significant (Ilidri et al., 2022).

BREEAM, on the other hand, is also now considered one of the strongest GB certification schemes (Doan et al., 2017). There are 3 areas in which BREEAM certification can be achieved: use, building and new construction and refurbishment. The score becomes higher as further sustainability criteria are met.

Green Globes Certyfication (GGC) is a three-in-one whole building certification system that evaluates the environmental sustainability, health & wellness, and resilience of all types of commercial real estate. Bible and Chikeleze (2018) explore favourable avenues of financing for real estate projects with GGC. They have demonstrated the significant financial advantage of obtaining the GGC and special Fannie Mae Programme (Bible and Chikeleze, 2018).

The Living Building Challenge is a certification program created by the International Living Future Institute in 2006. The LBC emphasises harmony between people and nature, is performance-based. Certifications are based on actual rather than expected performance and occur after the building's first operational year. ILFI has made it a strategic organizational priority to accelerate access to the benefits of biophilic spaces (International Living Future Institute, 2006).

LEED is a G.B. certification program developed by the U.S. Green Building Council in 1998. It involves a series of rating systems that deal with the construction and maintenance of buildings, which encourages sustainable and environmentally-friendly design. The building is assessed on the basis of five main criteria, i.e. sustainable location of the investment, water efficiency, energy and atmospheric use, use of materials and resources, and indoor environmental quality (an additional criterion is innovation in design, Zhang et al., 2017).

HQE certification system (Haute Qualité Environnementale) is based on performance benchmarks established in the Centre Scientifique et Technique du Bâtiment(CSTB), created in 1947, in France. HQE applies to commercial and residential buildings (NF HABITAT HQE) and is awarded by external organisations accredited by HQE. The process is structured into two instruments: the enterprise management system (EMS) and environmental quality of the building (EQB, Vazque et al., 2011).

Kryvomaz (Kryvomaz et al., 2018) points to the flexibility of this certification, more adaptable to the specifics of the country. HQE has a better innovative extension of the concept to the urban planning operations (Kryvomaz et al., 2018).

The *German DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen)* certification system was developed in Germany. Under the DGNB scheme, buildings are assessed in six main quality categories, i.e. environmental, socio-cultural and functional, technical, process and location. DGNB System is based on three essential paradigms: life cycle assessment, holistic approach, and performance orientation (Piętocha, 2024).

In conclusion, the use of multi-criteria building certification systems is becoming increasingly common in the building industry. Certifications such as BREEAM, LEED, and DGNB are among the most popular methods for assessing sustainable architecture (Piętocha, 2024).

All of GB certifications focus on environmentally friendly aspects, as well as creating a friendly working environment. It increases the market value of the property. It is best to start the certification process before buying a plot of land. Location should be sustainable, i.e. have close access to public transport, which reduces carbon dioxide emissions (*Certificates confirming green aspects of buildings increasingly popular*, 2024).

From the perspective of a mortgage bank, as an issuer of green covered bonds, green and low-energy buildings must comply with the Green Bond Principles (GBP). PKO Bank Hipoteczny (PKO BH), for example, developed criteria for energy-efficient buildings based on external consultancy advice, defining energy consumption thresholds for buildings among the top 15% most energy-efficient in Poland. Sustainalytics, an external consultant, confirmed that PKO BH's financing of energy-efficient properties has a positive environmental impact and aligns with the four core elements of the GBP 2018 (Second-Party Opinion, PKO BH ,2019).

It is recommended that issuers use an external assessment to confirm green bond compliance with the key elements of the GBP in the form of an external opinion (*second-party opinion*). PKO BH has obtained confirmation of GCBF compliance from the certified international firm Sustainalytics. In accordance with the principles adopted in the GCBF, PKO Bank Hipoteczny undertook to publish, within one year from the date of the issuance of the Green Lien Notes, a report on the allocation of the funds raised in the issuance on the Bank's website. The criteria for the evaluation and selection of green assets previously developed by PKO BH have gained acceptance by the Climate Bonds Initiative as Low Carbon Building Criteria and are now a benchmark for the energy-efficient residential property market in Poland (PKO Bank Hipoteczny press release: PKO Bank Mortgage will issue Poland's first green mortgage bonds worth PLN 250 million, 2019).

For mortgage banks, it is crucial that green covered bonds (GCBs) contribute to the UN SDGs, targeting sustainable development by 2030. For instance, PKO BH's GCBs issued in 2019 have financed or refinanced green housing supported SDG Goal 7 (affordable and clean energy), aiming to double global energy efficiency by 2030. Sustainalytics supports PKO BH's green building projects, citing their potential to reduce greenhouse gas emissions and help Poland meet its climate goals (Press information, PKO BH: Bank Mortgage will issue the first green mortgage bonds in Poland with a value of PLN 250 million,2019).

The buildings of the future will be ever more technologically advanced, taking into account the changing approach to sustainability and social needs. The World Economic Forum has developed a 'framework for the future of real estate', which indicates the desired direction of change (World Economic Forum, 2021).

Energy efficiency of the property has a significant risk-reducing effect for banks by improving the ability of borrowers to repay the loan and increasing the value of the property. In conclusion, the future of the real estate sector and its financing is moving in a green and sustainable direction.

GCB are a type of green bond (G.bond) that is one of the innovative financial instruments responding to the current challenges of reality. G.bond make it possible to raise capital and invest in new and existing projects qualified as "green" with environmental benefits.

Green mortgage bonds are defined as mortgage bonds (securities), the proceeds of which are used exclusively to finance new or refinance existing long-term mortgages for energy-efficient residential properties. GCBs are virtually identical in design, the difference being that the capital raised from the GBS issue is used to finance energy-efficient mortgages. The difference is that the capital raised from the issuance of GBS is used to finance energy-efficient mortgages.

Restrictive guidelines for the qualification of this type of bond are set by the International Capital Market Association (ICMA) as the Green Bond Principles (GBP, 2021), which aim to unify the international green bond market. The rules for a set of guidelines for the use of issue proceeds, the project evaluation and selection process, resource management and reporting.

The ECBC Fact Book defines GCB as bonds, where the proceeds (or an equivalent amount) of which are used to (re)finance in part or in full eligible green projects that meet certain green standards. In practice, the most common format adopted is a structure in which mortgages are provided for the purchase of residential and/or commercial properties that meet certain sustainability criteria. Although, as noted, Schuller et al. (2023) currently, four exceptions have been found in the green covered bonds market, deviating from the general pattern. Two issuers refinance green public sector loan assets, one issuer refinances renewable energy loans in a green format below the benchmark of the Luxembourg program, and one Swedish issuer refinances sustainable forestry with green covered bonds (Schuller et al., 2023).

A similar approach is represented by the International Capital Market Association (ICMA), which considers as green bonds any type of bond instrument in which the proceeds or an equivalent amount will be used exclusively to finance or refinance, in part or in full, new and/or existing eligible green projects and which comply with the four basic elements of the so-called Green Bond Principles (GBP), Green Bond Principles, 2021)).

Green covered bonds enable capital-raising and investment for new and existing projects with environmental benefits. The GBP seek to support issuers in financing environmentally sound and sustainable projects that foster a net-zero emissions economy and protect the environment (*Green Bond Principles Voluntary..., June 2021).*

The idea of creating uniform rules for green bonds is to help their widespread use by the market and its participants. Both by the issuers of green bonds, who, acting in a well-defined way, provide investors with the best product - a reliable and secure financial instrument. Promoting the availability of information enables green bonds investors to assess the environmental impact of their green bond investment. They also assist underwriters by providing support that facilitates the transaction, maintains market integrity. The GBP places a clear emphasis on the transparency, accuracy and reliability of the information that will be disclosed and reported by bond issuers to their stakeholders (Green Bond Principles Voluntary..., 2021).

According to Green Bonds Principles (GBP), there are currently four types of green bonds. New types of green bonds are continuously updated in the GBP publications, which include:

1. Standard Green Use of Proceeds Bond: an unsecured debt obligation with full recourse-to-the-issuer only and aligned with the GBP.
2. Green Revenue Bond: a non-recourse-to-the-issuer debt obligation aligned with the GBP in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes, etc., and whose use of proceeds goes to related or unrelated Green Project(s).
3. Green Project Bond: a project bond for a single or multiple Green Project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer, and that is aligned with the GBP.
4. Secured Green Bond (SGB): a secured bond where the net proceeds will be exclusively applied to finance or refinance either: The Green Project(s) securing the specific bond only (a "Secured Green Collateral Bond"); or The Green Project(s) of the issuer, originator or sponsor, where such Green Projects may or may not be securing the specific bond in whole or in part (a "Secured Green Standard Bond"). A Secured Green Standard Bond may be a specific class or tranche of a larger transaction.

This SGB category may include, but is not limited to, covered bonds, securitisations, asset-backed commercial paper, secured notes and other secured structures, where generally, the cash flows of assets are available as a source of repayment or assets serve as security for the bonds in priority to other claims. There should be no double-counting of Green Projects under a SGB with any other type of outstanding green financing and the issuer, originator, or sponsor (as applicable) must ensure full alignment with all Core Components of the GBP [GBP, Appendix I (June 2022)].

Importantly, in ICMA's view, some qualifying 'green projects' may also have additional social benefits. In contrast, the classification of the use of a proceeds bond as a green bond should be determined by the issuer on the basis of its primary objectives (referring to bonds that intentionally combine qualifying green and social projects) (GBP, 2021).

By pursuing five presumed environmental objectives, green bonds are intended to contribute to: climate change mitigation, climate change adaptation, conservation of natural resources, as well as protection of biodiversity, and environmental pollution prevention and control. The design of green bonds, therefore, offers the opportunity to choose from a range of possible options. With regard to the universe of GCB the following categories of measures and objectives financed by GCB, issuance can currently be Energy efficiency of buildings, including new and renovated buildings, energy storage, district heating, smart grids, appliances, and products.

1. Pollution prevention and control: air emissions reduction, greenhouse gas control, soil remediation, waste prevention, waste reduction etc.
2. Green buildings, which must meet regional, national, or international standards or certifications;
3. Clean transport: electric, hybrid, public, infrastructure for clean energy vehicles etc.;
4. Environmentally sustainable management of living natural resources and land use (including environmentally sustainable agriculture; environmentally etc. (Schuller et al., 2023].

In addition, ICMA has published a framework that helps parties to appropriately 'translate' their investment objectives into the so-called UN Sustainable Development Goals (SDGs). Market analysis shows that the following categories are the most popular among GCB issuers.

As reported in the ECBC Fact Book 2023, the majority of GCB, issuers are primarily focused on meeting targets 7, 11 and 13, namely: "affordable and clean energy" (7), "sustainable cities and communities"(11) and "climate action" (13). While issuers of Green Public Secured Bonds also cover objectives 6,7, 9 and 12, categories such as: "clean water and sanitation" (6), "affordable and clean energy" (7) and "industry, innovation and infrastructure" (SDG 9) and "responsible consumption and production" Currently, almost all GCB on the market are based on the GBP standards (The components of the GBP, 2021).

GBC's issues are targeted at institutional investors who, by investing funds in this type of security, gain greater exposure of their portfolios to green assets, with relatively low risk. In summary, GCB have great potential in providing financing for green projects that meets the UN SDGs and the Paris Agreement. Wider use of green bonds can contribute to CO2 reductions in the construction industry.

The EU's *Horizon 2020* framework program points to the need for standards for a standardised European 'energy-efficient mortgage' (mortgages, EEM), which would encourage property owners to take action to increase the energy efficiency of their property or to purchase such properties using preferential financing conditions (preferential interest rates and/or increased mortgage credit value).

EEMs are intended to finance the purchase/construction and/or renovation of both residential (single family & multi-family) and commercial buildings where there is evidence of: (1) energy performance which meets or exceeds relevant market best practice standards in line with current EU legislative requirements and/or (2) an improvement in energy performance of at least 30%. This evidence should be provided by way of a recent EPC rating or score, complemented by an estimation of the value of the property according to the standards required under existing EU legislation. It should specifically detail the existing energy efficiency measures in line with the EEM Valuation & Energy Efficiency Checklist (Definition of an Energy Efficient Mortgage, 2018).

The EEM pilot program, was launched on 14 June 2018 and is divided into three parts. The first relates to credit institutions ('financial management'), the second to energy efficiency institutions ('energy saving management'), and the third is guidance for valuers (property value management). Under 'financial management', the European Mortgage Federation has provided the following guidelines for banks (Energy Efficient Mortgage Pilot Programme 2018):

- Guideline No. 1 - Green Mortgage: the loan should finance the acquisition/construction of an energy-efficient dwelling or allow for the thermomodernisation/renovation of an existing property;
- Guideline No. 2 - Green Mortgage Funding Mechanism: Make loans available on preferential terms due to the positive impact of the energy-efficient project on the borrower's risk profile and property.
- Guideline No. 3 - Leading the Investment: The loan should enable building performance improvements, including gradual energy improvements over the loan's life;

- Guideline No. 4 - Technical Experts: The lender should keep records confirming the qualifications of an energy efficiency expert involved in the property's design, renovation, or technical advice, who has issued an energy certificate for the property;
- Guideline No. 5 - Contractor/SME: The lender should maintain records confirming that all energy conservation work was performed by a qualified contractor using appropriate materials and tools;
- Guideline No. 6 - Access to Additional/Alternative Financing: The lender or third party should provide information on available support instruments and tax benefits for achieving energy efficiency, alongside mortgages offered for energy-efficient properties;
- Guideline No. 7 - Valuation Requirements: Lenders should instruct appraisers to consider property energy-saving indicators in appraisal reports;
- Guideline No. 8 - Customer Relationship Management: Banks should provide information on how loan conditions improve if used for energy-efficient properties or provide insight into other products that enhance savings;
- Guideline No. 9 - Optimising Relationships with Market Actors: Lenders should cooperate with entities specialized in energy-efficient construction to support borrowers;
- Guideline No. 10 - IT Systems: Loans granted per programme guidelines should be tagged in credit institutions' IT systems, as defined in an IT protocol. The portal will be linked to the recommendations arising from the requirements for Energy Certificates and subsequently to the EE passport of the building;
- Guideline No. 11 - Use of Data: Lenders should use data for risk analysis, especially for determining default probabilities, and provide this data to the EeMAP Programme Coordinator;
- Guideline No. 12 - Mortgage financing: when mortgage receivables are used in the collateral register for the issuance of mortgage bonds, they should be labelled Green Mortgages (EEMs) in order to refinance them with Green Bonds (covered bonds).

PKO Banki Polski and PKO Bank Hipoteczny were the first banks from Poland to join the Energy Efficient Mortgages Initiative (EEMI) pilot project. EEMI has been the catalyst for the growth of a new, integrated, multi-stakeholder energy-efficient mortgage ecosystem. The EEMI seeks to introduce a greener, more sustainability-focused means of buying, renovating and living in our homes [Energy Efficient Mortgages Initiative 2015].

The project aims to create standardised, pan-European solutions for mortgages granted to finance flats and houses that incorporate energy-efficient solutions. Among other things, the EEM project aims to build a package of preferences for borrowers to encourage them to buy energy-efficient properties or to improve the energy efficiency of existing buildings. In the longer term, the program's activities may translate into lower risk weights for banks. This is intended to incentivise banks to play a key role in driving climate change action in the European construction sector. EEML reporting provides information on portfolios of energy-efficient mortgages in financial institutions' portfolios. The report provides comparability both between different players in the market and in relation to traditional real estate finance sources, and provides greater transparency on climate risk. Currently, 70 institutions from various European countries participate in the initiative (Energy Efficient Mortgage Pilot Programme, 2018).

The Energy Efficient Mortgage Label (EEML) is a clear and transparent quality label for consumers, lenders and investors, aimed at identifying EEM in lending institutions' portfolios, which are intended to finance the purchase/construction and/or renovation of both residential (single family & multi-family) and commercial buildings, with a focus on building energy performance.

The EEML is intended to scale up private market support for the NextGenerationEU vision, the EU Renovation Wave Strategy and the EU Green Deal, by acting as a catalyst for consumer demand and a driver of the qualitative upgrade of the energy profile of lending institutions' portfolios and of enhanced asset quality.

The objectives of the EEML are to maximise portfolio regulatory alignment with the main legal and policy developments, such as the EU Taxonomy, Mortgage Credit Directive (MCD), Capital Requirements Regulation (CRR) or equivalents at the international level [The Energy Efficient Mortgages Label].

Poland's largest issuer of green covered bonds - PKO Bank Hipoteczny - bases its criteria for assessing the energy efficiency of financed residential buildings on market data and the legal regulations in force in Poland. In addition, special criteria developed for the Bank by green building consultant Drees&Sommer were commissioned and approved by the independent international organisation Climate Bonds Initiative as a benchmark for the assessment of green residential buildings in Poland (website PKO BH).

In summary, mortgage lending in Europe is equivalent to around 46% of the EU GDP. The development of green mortgage lending is crucial for the realisation of a climate-neutral economy. The mortgage industry plays an important role in efforts to tackle climate change by funding the home renovation programs needed to improve the energy performance of buildings in the EU. Since its inception in 2015, the EU's Horizon 2020-funded Energy Efficient Mortgage Initiative (EEMI) has catalysed the development of a new, integrated, multi-stakeholder energy efficient mortgage ecosystem. EEMI aims to bring greener, more sustainability-focused ways of buying, renovating and living in our homes (EMI, 2015). Such a huge potential of the mortgage market, including the green mortgage segment, requires instruments to refinance them, and green covered bonds provide such an opportunity.

On 25 September 2015, the UN General Assembly adopted the "2030 Agenda for Sustainable Development," establishing a new global framework for sustainable development. The agenda includes the UN Sustainable Development Goals (SDGs), covering economic, social, and environmental dimensions (*Transforming our world: the 2030..., 2015).*

Effective transition towards net zero will require concentrated effort across the ecosystem. Central banks and financial regulators have an important role to play in this effort. Firstly, they must ensure that the financial sector stays resilient amid the physical and transition risks posed by climate change. Secondly, they must help mobilise the financing needed to decarbonise the global economy.

Therefore, the Network for Greening the Financial System (NFGS) brings together committed stakeholders, with central banks and supervisors aiming to step up their work on climate and environmental risk and on scaling up green finance. The NGFS, which was launched by its eight first members at the One Planet Summit in December 2017, now comprises 134 central banks and supervisors, together with 21 observers responsible for the oversight of: 100% of the global systematically important banks and 80% of the internationally active insurance groups The Network's 89 members represent countries which together constitute of 85% of global GDP and 75% of greenhouse gas emissions (Network for Greening the Financial System, 2017). On 12 March 2024, the European Parliament adopted an amendment to the EU's Energy Performance of Buildings Directive (EPBD), which introduces new energy efficiency requirements for buildings across the EU from 28 May 2024 (EPBD, 2024). The intention of the EU legislator was to achieve a fully decarbonised building stock by 2050. This process is to be achieved, among other things, through the renovation of buildings in each member state, in particular the buildings with the worst energy performance (Communication to MPs, Petition No. 0734/2023). From 2030, new buildings are to become zero-carbon, and the existing stock is to be progressively upgraded to achieve climate neutrality by 2050 (Proposal for a Directive of the European Parliament and of the Council on the energy performance of buildings, 2021). Achieving these ambitious targets will not be possible without adequate financing and the implementation of adequate financial instruments.

The introduction of minimum energy performance standards is a key stimulus for the successful energy transformation of the real estate sector. The Directive also normalizes requirements for the maintenance of national databases on the energy performance of buildings, access to these databases and the publication of information. The renovation of buildings will reduce the cost of energy consumption and contribute to reducing the negative phenomenon of energy poverty (Questions and Answers on the revised Energy Performance...). It will also increase the value of buildings with better energy performance. The studies on the subject show a strong trend towards an increasing gap between the market values of properties with different performance classes (Micelli et al., 2023).

For the domestic covered bond market, including green covered bonds, a positive development and a good prognosis for the future is the resolution adopted on 5 July 2024 by the Financial Supervision Commission (FSC) to issue a Recommendation on the Long-Term Funding Ratio (WFD, Resolution no. 243/2024 of the Financial Supervision Commission of 15 July 2024). This recommendation applies to domestic banks and the aim of it is to reduce the risks associated with the current mortgage funding structure and to change this structure by increasing the share of long-term debt instruments in banks' liabilities in relation to the value of mortgage loans granted. The supervisor expects that from the end of 2026, banks will be required to maintain this ratio at a level of at least 40 %. According to Scope Ratings Agency (2024), the introduction of the WFD will support the development of the Polish mortgage bond market, in particular green covered bonds. The FSC is the first national regulator to support climate transformation and green debt securities, converging with the EU Green Bond Standard or Green Bond Principles in this way. According to WFD- PAP calculations, debt securities that converge with these guidelines receive a 20 per cent higher weighting than standard debt (WFD will help to develop the Polish mortgage bond market, including green bonds - Scope Ratings (opinion).

CURRENT STATE OF THE MORTGAGE BOND MARKET IN POLAND – CASE STUDY

As a case study, PKO Bank Hipoteczny is presented as an example of the largest mortgage bank and issuer of mortgage bonds in Poland, which has completed the issuance of green mortgage bonds twice. An issue of green mortgage bonds, realised in 2022, in the amount of EUR 500 million, whose main buyer was the European Bank for Reconstruction and Development, was described.

The basic regulation that governs the activities of mortgage banks in Poland, including their issuing activities, is the Act of 29 August 1997 on covered bonds and mortgage banks [Journal of Laws 1997, consolidated text 2023, item 110]. A mortgage bank (M.B.) is authorised to issue covered (mortgage) bonds and public mortgage bonds (art.2b). Pursuant to Article 2a of the Act, a covered bond is defined as a debt security issued by a M.B. in accordance with the provisions of the Act, which is secured by assets pledged as collateral for mortgage bonds, against which mortgage bond holders have a direct claim both to a separate bankruptcy estate separated in accordance with the provisions of the Act of 28 February 2003. - Bankruptcy Law (consolidated text 2024, item 794), as well as to the Mortgage Bank. A covered bond is a registered or bearer security based on a mortgage bank's claims secured by mortgages, in which the M.B. undertakes towards the holder to fulfil certain monetary benefits (article 3.1, the Act on covered bonds and mortgage banks).

While the legislator does not specify what a GCB. is, the aforementioned definition also refers to a GCB. It does, however, indicate in Art. 7d. 1 of the covered bonds and M.B's act, that a covered bond may be designated as a "European covered bond" or a "European covered bond" with a translation of this designation into all official languages of the European Union. The mortgage bond meets the requirements set out in the Article 129, Regulation (EU) No 575/2013 Of The European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (Article 129, Regulation (EU) No 575/2013 Of The European Parliament and of the Council of 26 June 2013 *on prudential requirements for..., 2013)* may be designated as a "European covered bond (premium)" or a "European covered bond (premium)" with a translation of this designation into all official languages of the European Union[article 7d covered bonds and mortgage banks act].

To the extent not regulated by the Covered Bonds and M.B.'s Act, the following provisions apply to the rules for the issue, trading and redemption of mortgage covered bonds: the Act of 29 July 2005. on public offerings and conditions for the introduction of financial instruments to the organised trading system and on public companies (consolidated text 2024, item 620), Regulation (EU) 2017/1129 of the European Parliament and the Council of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC [55], the Act of 29 July 2005 on trading in financial instruments (consolidated text 2024, item 722); the Act of 15 January 2015 on bonds (consolidated text 2024, item 708). Mortgage Banks are required by law to maintain a mortgage bond collateral account. This account plays an extremely important role for the activities of a mortgage banks and, in particular, for monitoring the collateral status of mortgage bonds as essential instruments for refinancing its activities.

Another important safeguard for the issuing activities of a mortgage bank is the increased supervision and the institution of a trustee. The trustee is one of the most important elements of the system for protecting the interests of purchasers of mortgage bonds that a mortgage bond issues to refinance its lending activities. In conclusion, due to the stringent legislation in Poland, green mortgage bonds issued by domestic mortgage banks meet the highest safety standards.

The Polish mortgage bond market, despite the passage of twenty-six years since the entry into force of the Act of 29 August 1997 on mortgage bonds and mortgage banks (consolidated text Dz. U. 2023, item 110), which restored the possibility of issuing mortgage bonds in Polish law, is still at a limited stage of its development. This is influenced by a number of factors, including overly stringent legislation that blocked the issuing capacity of mortgage banks in Poland for a number of years.

According to the model of specialized mortgage banks adopted by the national legislator, covered bonds, also green covered bonds, are issued exclusively by these institutions. The mortgage mechanism is that these banks aggregate the aggregate demands of customers with the same interest rate, repayment term, and credit conditions and issue mortgage bonds on this basis.

The proceeds from the sale of these letters are used to finance lending activities (the Act of 15 January 2015 on bonds, consolidated text 2024, item 708).

In the case of GCBs, similarly, the proceeds from the sale of these letters are used to finance 'green' lending and refinance 'green' mortgages. Mortgage bonds are a type of bond secured by mortgage loans. The basis for the issuance of mortgage covered bonds are only selected housing loans in Polish zloty or Euro, which meet conservative criteria for their granting, both in terms of the assessment of the borrower's creditworthiness and the valuation of the property serving as collateral. Green mortgage covered bonds are secured by housing loans selected on the basis of the Green Covered Bond Framework adopted by the M.Bs. and certified by the Climate Bond Initiative.

At the end of June 2024, there were five M.Bs. operating in the domestic market: PKO Bank Hipoteczny SA, mBank Hipoteczny SA, ING Bank Hipoteczny SA, Pekao Bank Hipoteczny SA and Millenium Bank Hipoteczny SA. Two of them, PKO Bank Hipoteczny SA and ING Bank Hipoteczny have completed G.C.B issues. In contrast, all mortgage banks have been certified as 'green' by Climate Bond Certified, in which the guidelines for issuing green covered bonds are clearly specified. The criteria apply to properties located in the Republic of Poland. The criteria for financing and refinancing residential properties are based on the Climate Bonds Initiative's Low Carbon Certification methodology.

PKO Bank Hipoteczny SA is the largest mortgage bank and the most active issuer of mortgage covered bonds in Poland, specialising in the provision of PLN-denominated housing loans (PLN 8.4bn of covered bonds remaining to be redeemed, 50% of market as at 30.06.2024, Investor presentation PKO Bank Hipoteczny SA, 2024). PKO Bank Hipoteczny is a first-time issuer of EUR-denominated benchmark covered bonds supporting sustainable development in Poland and Central and Eastern Europe. Its main objective is to obtain long-term financing through the issuance of mortgage-covered bonds. The basis for the issuance of mortgage covered bonds are exclusively housing loans in Polish zlotys which meet conservative criteria for their granting, both in terms of the assessment of the borrower's creditworthiness and the valuation of the real estate constituting their collateral (bank-mortgage value of the real estate) (art.22, Act of 29 August 1997 on mortgage bonds and mortgage banks). GCBs. by PKO BH are secured by housing loans selected based on the requirements of the PKO BH Green Covered Bond Framework and certified by the Climate Bond Initiative.

As the only issuer from Poland, since November 2016, it has been conducting benchmark (with a minimum value of EUR 500 million) issues of euro-denominated mortgage bonds, which are targeted at institutional investors from the international market (Press release from PKO Bank Hipoteczny SA, 2022). It is a pioneer in green mortgage bonds in Poland, having successfully completed its first issue in 2019. According to information from PKO BH Bank's prospectuses, green covered bonds were issued in accordance with the guidelines contained in the 'PKO Bank Hipoteczny SA Green Covered Bond Framework. PKO's compliance with the GBP, was confirmed by an opinion from Sustainalytics (*Second-Party Opinion, PKO Bank Hipoteczny SA Green Covered Bond, 2019)*. The funds raised from the covered bond issue were used in part for M.B. lending, based on the financing of low-energy housing projects. In addition, they made it possible to refinance the acquisition of receivables, in connection with the granting of mortgages for energy-efficient properties. Significantly, the GCB issue was distinguished by its oversubscription.

According to the authorities of PKO BH, the bank's involvement in the growing GCB market stems from the fact that it is the largest issuer of mortgage bonds in Poland and a leader in this market. This obliges it to introduce innovative financial products and set new standards (Green covered bonds *PKO Banku Hipotecznego,* 2024).

Another issue was completed on 27 June 2022, when PKO BH launched a €500 million GCB subscription for institutional investors, with a maturity date of 25 June 2025. Purchase declarations were collected from more than 50 investors for a total amount of more than €850 million. The issue was the bank's first GCB issue denominated in euros. The proceeds from the issue were used to finance and refinance low-carbon residential buildings. The GCBs were listed simultaneously on the Luxembourg and Warsaw stock exchanges. The securities bore a fixed interest rate in euros (Press release from PKO Bank Hipoteczny SA, 2022). PKO BH's G.C.B. -both denominated in PLN and euros, have been given an Aa1 rating by Moody's Investors Service. The level of rating assigned is the highest possible for Polish securities.

The issue of GCBs. carried out by PKO BH was not only the first international GCB issue carried out by a Polish bank, but also the first such issue in an EU country where the EBRD has operations. The EBRD invested EUR 65 million (13% of the issue amount) in PKO BH's GCB's. The issuance of the covered bonds complied with the rules for the issuance of GBP green bonds, the International Capital Market Association and the Climate Bonds Standard, as verified by an independent second-party opinion ("SOP") prior to subscription. The GCBs had a maturity of three years.

EBRD's activity as an investor in GCB was carried out within the framework of Project Jaspis, which aimed to promote sustainable financing by supporting the issuance of Green Lien Letters, in this case, the largest M.B. in Poland. The project stimulated the development of the capital market in Poland and increased the stability of this important financial institution. The project promotes the green transformation in Poland by supporting PKO BH's green agenda and further supporting the issuance of GCBs. According to the EBRD authorities, the use of GCB, is still at a limited level in EBRD countries of operation, including Poland. The project supports the stability of the financial system by developing the capital market by supporting the issuance of covered bonds, including GCB, and building the critical mass of outstanding Polish covered bonds needed to create price benchmarks, build the yield curve, develop market liquidity, and attract international and local institutional investors, and optimise the structure and diversify the bank's funding sources. The added value of the project stems from PKO BH's support in the issuance of GCBs in an environment of significant uncertainty in the capital market, diversification of the investor base, as well as the development of the market for these instruments (Yuspis Project, 2022).In summary, the successive issuance of green covered bonds by PKO BH and the involvement of the EBRD as an investor willing to purchase green covered bonds strengthened the mortgage bank's position as a trusted issuer of these instruments on the international financial market. Further proof of investor confidence was the more than 40 per cent reduction made in the subscriptions of the 2022 issue.

mBank Hipoteczny SA (formerly Rheinhyp-BRE Bank Hipoteczny), the second largest issuer of mortgage bonds and the longest-established MB. in Poland, has not yet completed green issues. The value of the Bank's issued mortgage covered bonds outstanding as at 31.12.2023 amounted to PLN 5.87 billion, representing 31.8 per cent of the total market (Investor presentation, 2024). As highlighted by the authorities of the mBank Group, the group aims to promote sustainable growth in its various areas of activity, taking into account the issuance of debt securities. To this end, it has developed a framework for issuing GCB, the mBank S.A. Group Green Bond Framework. The document contains the mBank Group's objectives and principles for supporting the EU environmental goals and the UN Sustainable Development Goals. The mBank Group Framework is in line with the GBP as confirmed by the international agency Sustainalytics (Information from website mBank Hipoteczny SA (2024): Green bonds, Green covered bonds).

ING Bank Hipoteczny SA 's first GCB issue was completed on 10 October 2019, when the bank issued a five-year GCB worth PLN 400 million. The nominal value of one mortgage bond was PLN 500,000. During the book-building process, declarations of purchase were made by 15 investors for a total amount of nearly PLN 600 million. The issued mortgage bonds are listed on the regulated market of the Warsaw Stock Exchange and the Luxembourg Stock Exchange. Moody's Investors Service has assigned ING BH GCB an Aa3 rating, The bank's prospectus was approved by the Commission de Surveillance du Secteur Financier in Luxembourg. The prospectus was also passported to the Financial Supervision Commission. The value of the entire programme amounted to €5 billion (ING Bank Hipoteczny SA press release, 11.10.2019).

The EBRD has acquired ING BH green mortgage bonds worth PLN 80 million. As argued by the EBRD authorities, the investment in ING BH's green mortgage bonds is a way to strengthen both the development of the green economy and the capital market. (...) The EBRD supports sustainability efforts and, through its investments, encourages issuers to be transparent and to adhere to high standards and to report on the environmental benefits and impacts of projects (Information press ING Banku Hipotecznego SA (11.10.2019). The funds raised from the GCB issue were used to finance energy-efficient 'green' mortgages. For ING BH, the rigour of the GCB issuance is based on four assumptions, including the assumption of a linear zero-carbon trajectory by 2050 (low-carbon trajectory) based on the CBI's Low Carbon Buildings Criteria (*Green Bond Criteria- ING- BH).* As justified by the M.B,. authorities, investor interest in green bonds is mainly driven by the desire to strengthen the development of a sustainable economy and the need to invest in safe and transparent products whose concept is based on high standards.

Pekao Bank Hipoteczny SA, which has been operating on the domestic market for 25 years, and Millenium Bank Hipoteczny SA, the 'youngest' in seniority, have not yet completed a green bond issue.

Table 1. Green covered bond issues carried out by mortgage banks in Poland, as at 30.07.2024

Date of emission	The name of the emitent	Value	Currency	Maturnity	Rating	Ratings Agency
30.09. 2019	PKO Bank Hipoteczny	250 mln	PLN	5 years	Aa1	Moody's Investors Service
10.10. 2019	**ING Bank Hipoteczny**	**400 mln**	PLN	5 years	Aa3	Moody's Investors Service
27.06.2022	PKO Bank Hipoteczny	500 mln	EUR	3 years	Aa1	Moody's Investors Service

Source: own compilation based on data published by mortgage banks

For the domestic covered bond market, including GCB, a very positive development and a good prognosis for the future is the adopted WFD Recommendation (Resolution No. 243/2024 of the Polish Financial Supervision Authority of 15 July 2024 on the issuance of the WFD Recommendation concerning the Long-Term Funding Ratio). National mortgage banks meet all the most restrictive criteria related to the issuance of GBC. The high standard of GMLs is confirmed by the ever-increasing interest of institutional investors in this project, as the EBRD is having a very positive impact.

An important role in the creation of the GCB market in Poland is played by the criteria these financial instruments meet, designated by the International Capital Market Association as the Green Bond Principles, which have a positive impact on the transparency process of the issue, making them credible in the eyes of investors. Another advantage of GCBs is their inclusion in the Climate Bonds Initiative agency certification system and their high ratings from rating agencies, which lend credibility to the high quality of these securities. GCB ratings are very often at triple A, and the ratings are stable over time.

An important factor influencing the success of a GCB issue is the credibility of the issuer, i.e. the domestic M.Bs. The investor expects that the funds raised by the issuer as a result of the issuance of G.M.B. will be used to finance sustainable activities. Therefore, it is desirable for issuers to use widely recognised standards such as the Green Bond Principles or the Climate Bonds Standard. This condition is met by Polish mortgage bond issuers.

The EBRD is among the investors investing spare funds in issued Polish covered bonds. This is one of the best recommendations for their safety and transparency. Poland is the largest recipient of EBRD financing in the EU. It is expected that in July 2024. The EBRD will announce a country strategy for Poland for 2024-2029, declaring that one of its priorities will be to support the transition towards a green economy. Given the implementation of projects supporting the issuance of green bonds, it can be assumed that such activities will continue. This is another good prognosis for the future development of green bonds in Poland (Felcetti, 2024: The EBRD's new strategy for Poland is just around the corner, Rzeczpospolita). In 2023. The EBRD invested EUR 1.3 billion in Poland, the highest ever, compared to EUR 0.99 billion in 2022. 75 per cent of the investments undertaken in Poland were specifically in the green financing area. According to EBRD authorities, the green area will remain key due to the huge investment needs in decarbonisation, among others (Poland is the largest recipient of EBRD financing in the European Union, Bank.pl, 2024).

On the other hand, an important developmental constraint for the green covered bond market is an important developmental limitation is the lack of consistency in the definition of a 'green mortgage bond' and a 'green (low-energy) mortgage in Poland.

CONCLUSIONS

The research questions posed at the outset have been answered, which indicates that green mortgage banks are an expression of the banking sector's involvement in the process of financing the transformation of the economy and the construction sector towards a more sustainable and greener one. The green covered bond market in Poland is a promising market, while its further development depends on a number of factors, including the development of the green residential real estate market and the green mortgage market. It is necessary to implement legislative and systemic solutions to promote green bonds. and its green financing, including the use of domestic green covered bonds.

It is important to remove the barriers that limit the activities of mortgage banks and mortgage bond issues. On 1 January 2016, an amendment to the Act on mortgage bonds and M.Bs came into force, which removed some of the barriers to the development of this market. One of the still-present demands made by mortgage banks is to improve the liquidity of the mortgage bond market in Poland through uniform treatment of mortgage bonds with treasury bonds and EIB securities when determining bank tax or the possibility to conclude CIRS transactions (used as a liquidity tool) with the National Bank of Poland (more information: Gorlecka-Łabiak, 2020, 2022).

Mortgage banks operating in Poland declare their readiness to carry out regular green covered bonds issues, which will be appreciated by investors and rating agencies. On the other hand, the chance to implement effective measures to reduce the greenhouse gas emissions of the real estate sector depends on the close cooperation of all real estate stakeholders. Both state and local government representatives, the financial sector, representatives of the development industry, etc. The Ministry of Climate and Environment in 2023 completed a project aimed at: increasing the share of near-zero energy buildings in the total number of buildings; promoting pro-environmental solutions in construction and disseminating information on available forms of support for this type of investment; creating a fashion for eco-building in Poland and environmentally friendly building materials and construction methods, including in particular the use of wood in constructions (*Eco-building Project*, Ministry of Climate and Environment, 2023).

The GCB system stabilises the banking and financial system and its green transition. The secure, long-term nature of covered bonds contributes to financial stability and resilience to potential economic crises.

The OECD recognises green bonds as one of the most promising financial debt instruments for financing the energy transition and the transition to a low-carbon economy. Furthermore, a number of scientific studies prove the attractiveness of green bonds, their ability to redistribute the cost of financing. Therefore, their use can contribute to mitigating climate change over generations, attracting both private and public investors willing to invest spare funds in green investments.

Energy transformation and decarbonisation require a major transformation of the housing stock. GCB are the right financial instrument to achieve these intentions. GCB can make a significant contribution to achieve climate neutrality.

Ehlers and Pecker (2017) emphasized that favourable market conditions must exist for the development of green bonds. Both issuers and investors should be satisfied with the returns and security of such securities. Otherwise, this financial instrument will face challenges in the future (Ehlers, T., & Packer, F., 2017). The development of the green bond market, which requires not only favourable market conditions but also legislative and systemic support, should be approached in a similar way.

In conclusion, the subject area of green mortgage bonds on the example of Poland is very poorly recognised, therefore the conclusions of the study signal the problem but do not solve it, and require further observations.

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